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UNIVERSITY OF TORONTO

SCIENCE AND MEDICINE DIVISION

REPORT OF THE DEAN

OF THE

FACULTY OF MEDICINE

Session 1955-1956

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Report of the Dean of the Faculty of Medicine

The Faculty of Medicine this year completed the professional education of 154 students, and these young men and women were presented for their degrees at the annual convocation for Law and Medicine on June 15th. Sir Howard Florey received an Honorary Doctorate of Science, and addressed Convocation. In the absence of the President, the Dean of the Faculty of Law had some timely advice and comment for the graduating classes. The number of those who completed their course in medicine very nearly equals the combined total of the classes of the other three schools in the province, and one is reminded of the current discussions relating to the tremendous number of students who are expected to arrive at the doors of Canadian universities in the years 1960 to 1965.

The "Plateau Committee" of our own University has already made a preliminary report to the Senate with certain recommendations for the expected increase. The Faculty of Medicine was asked to report to the committee on the basis that medical students will be expected to increase in the same alarming rate which the statisticians have predicted for the universities and colleges of the nation. Whatever the policy of universities and colleges, faculties of medicine cannot multiply their output by adding staff and enlarging their laboratories—unless it be on a short-term basis to deal with some national crisis—if they are to maintain the standards of professional scholarship and competence. It is obvious that this school is already larger than the ideal, and although there is little likelihood it will ever be smaller in numbers of undergraduates, any pressure to increase its output permanently under the existing organization should be resisted.

There are two ways to provide facilities for larger numbers of medical students in this province: first, by the establishment of other medical schools in universities which have no faculty of medicine at the present time, or secondly, by the establishment of a second school within the existing faculties in communities where hospitals can afford the added clinical facilities. There are many facets to this situation, however, and there is as yet no evidence that properly qualified candidates for the professional course are lacking facilities to study medicine in Canada. National statistics show that even with our rapid increase in population the physician-population ratio has remained the same (approximately 1:950) for the past forty years. Other figures show that during the same period we have contributed each year to the United States approximately the output of an average-sized medical school. There are some 4,000 doctors, graduates of Canadian schools, living and presumably practising in the United States. There are approximately 16,000 doctors in Canada; 900 are graduated each year from Canadian medical schools at the present time, and this will increase to 950 with the completion of the course at Saskatchewan next year.

In three years 1951–4 the population-physician ratio in Ontario has not altered appreciably—1951 (874), 1954 (858). The total number of registered physicians in those three years has increased by 619.

The output of four schools during that period was approximately 950. The number of registered physicians dying in Ontario each year is approximately 105. Leaving out the question of migration, the present school output could be responsible for such a remarkable increase. It is true that there has been a considerable wastage each year through emigration to the United States but this is probably more than balanced by migration from Europe and from other provinces in Canada.

The Ontario Health Survey report published in 1951 estimated that, with the output of four medical schools and with the then rate of emigration and immigration of doctors, in 1961 there would be 7,311 doctors in the province with a physician-population ratio approximately 725. Nevertheless, consideration may have to be given to planning for the establishment of new medical schools, if, as the statisticians

anticipate, there will be in Canada a population of 21,500,000 in 1965, and if in the light of experience of the next decade, the present rate of increase in population is likely to be maintained.

Teaching

A committee is presently studying a suggestion that teaching in the last two years be decentralized as much as possible, and that students be assigned to one of the three teaching general hospitals where the staff would be responsible for all their clinical instruction except in the case of paediatrics. There would still be central instruction given in the way of lectures and theatre clinics. No recommendation has been made to the Faculty Council as yet.

An agreement has been signed with the Women's College Hospital to establish a teaching department in Obstetrics and Gynaecology. In the coming session students of the third year will be sent for instruction to the hospital, and the following year the department will be used for teaching and practical work in the final year.

The Department of Hygiene and Preventive Medicine was discontinued as a department in this Faculty on June 30, 1956. The members of the department will continue to give instruction to the undergraduate students as members of the new Department of Public Health established in the School of Hygiene. The news of this action taken by the Board of Governors as part of the reorganization of the School of Hygiene was heard with some concern and misgiving on the part of the members of the Faculty of Medicine. The President has given assurance that at both the administrative and the academic level some means may be found whereby these two units of the University can work more closely together in teaching and research in the broad field of medicine. There has been, since the establishment of schools of hygiene under the stimulus of the Rockefeller Foundation some thirty-five years ago, a tendency—even a requirement in the minds of some teachers in the public health field—to make this a separate discipline which should, if it were to make progress, achieve independence from the traditional schools of medicine. From time to time in my annual reports I have spoken of the increasing efforts on the part of the teachers of preventive medicine in our own school to relate their work to that of the clinicians in medicine, paediatrics and obstetrics. Preventive medicine to me *is* medicine. Every good doctor, every good teacher, discusses prevention, and believes in social medicine.

In his opening address to the School of Hygiene the new Director left no doubt in the minds of his hearers that the teaching of Canadian public health must be closely related to the everyday work of the clinician. It remains to be seen whether the objectives of medicine in a university—teaching and research—can be more effectively achieved by two organizations working under separate administrative arrangements. This and other matters related to a closer integration of the work of the two schools will undoubtedly be the subject of study by the committees which the President has established. In the meantime, the members of the newly constituted Department of Public Health and the Director of the School of Hygiene may be assured of the continued trust and co-operation of their colleagues in the Faculty of Medicine.

Postgraduate Activities

In my last report I said that the Faculty had recommended the establishment of a Division of Postgraduate Education within the Faculty, to carry on more effectively the ever expanding programme previously administered under a committee. The Board of Governors approved the recommendation and the Division was established, Dr. Ian Macdonald being appointed its first Director. The Division has the services of a part-time secretary and an office in the medical building. A small, attractive booklet has been published in which are listed the various postgraduate activities of the departments concerned. There is a steadily increasing demand for postgraduate instruction by individual doctors both in Canada and

abroad, not only in regular graduate courses, but also in some special branch of the very diversified field of modern medicine. The support from the Kellogg Foundation for our decentralized scheme of postgraduate medical instruction will cease this year. The medical societies in the districts visited have made several contributions towards its maintenance and it is hoped that the Provincial Department of Health, recognizing the importance of this aspect of education for doctors, will see fit to grant some support now that the feasibility and practical value of the plan have been demonstrated. The annual refresher course in medicine, surgery and obstetrics continues to draw large numbers and there are several more applicants this year than places available.

Buildings

Good progress is being made on the new buildings at the General Hospital. The alterations for the benefit of out-patients at St. Michael's are nearly completed. The Ontario Cancer Institute, being built in close proximity to the Wellesley Hospital, is nearing completion and should be occupied before another year. The new wing of the Women's College Hospital is nearly ready for occupancy (I have spoken elsewhere of the early institution of teaching in obstetrics at that hospital).

For several years in these annual reports I have stressed the inadequate physical facilities which the Professor of Psychiatry and his colleagues have faced in teaching and attempting to give leadership in the treatment of those who, in the Professor's words, have had a "break down in living." The activities of the Department of Psychiatry are centred in a small hospital of eighty beds, built thirty years ago as the first combined effort between state, city and university to do something for the problems as seen at that time in a city of under 500,000, and a province with a population of 3,145,000. Plans were prepared more than two years ago for a new Psychiatric Institute for treatment and research. They seem today no nearer to being translated into a building. During the past session a committee of the Board of Governors of the University prepared an excellent report, with recommendations for a new building, and for certain alterations in the present method of administering a government-university psychiatric centre. These recommendations were accepted by the Board and forwarded to the Government of Ontario. It is obvious that only through government sources can an institute combining newer methods of treatment, training, research and leadership in the modern approach to psychiatric problems be built and financed. It is also obvious that where the government has accepted responsibility for the day-to-day care of large numbers of psychotic patients, it will be interested in research into the fundamental causes of mental illness, and the training of men who will concern themselves with treatment. The Professor and his staff have given enthusiastic and enlightened leadership, and it is to be hoped that means will shortly be afforded to provide them with the necessary tools.

Staff

We welcome Professor H. Cullumbine who has arrived from Britain to take charge of the Department of Pharmacology. He comes to us with experience in teaching and research both in Britain and in Ceylon where for four years he was head of the Department of Pharmacology. He has more recently been responsible for the Medical Division of the Chemical Defence Experimental Establishment at Salisbury, England. Dr. R. C. Dickson has gone to Halifax as Professor of Medicine at Dalhousie University. As noted in Professor Farquharson's report, we regret Dr. Dickson's leaving us—I had a particularly close association with him as Chairman of the Committee on Postgraduate Studies—but we congratulate him on becoming a department head in that institution which has supplied so many academic leaders to Canada. Dr. John Grant retires after many years of distinguished service to this University as Head of the Department of Anatomy. Beloved and respected by students and colleagues, a brilliant teacher and writer, and a great gentleman, we are glad that he will continue as Curator of the Anatomical Museum. The new

Head is Professor J. W. A. Duckworth who came from Edinburgh to join the Department four years ago. Dr. J. C. Watt, who will be remembered by hundreds of medical students as a great teacher of anatomy, retires this year after forty-five years of service. Dr. Arthur Ham will continue as Professor of Histology, but will also direct the Division of Biological Research in the new Cancer Institute on Wellesley Street. Dr. Ham's interest in cancer research has steadily increased in the past few years, and this new arrangement will give him greater facilities and will bring the new Institute, as was the intention of its founders, into close working relationship with the medical school. I have spoken of the reorganization of the School of Hygiene. Dr. Andrew Rhodes of the Department of Paediatrics, and Director of the Research Institute at the Hospital for Sick Children, has been appointed the new Director of the School of Hygiene. Dr. C. E. Van Rooyen of the Department of Bacteriology in this Faculty, and the Department of Virus Infections in the School of Hygiene, has gone to Dalhousie University to head the Department of Bacteriology. Dr. A. W. Farmer has been appointed Surgeon-in-Chief of the Hospital for Sick Children, and Associate Professor of Surgery in the University.

In the Department of Anaesthesia, Dr. Easson Brown retires from undergraduate teaching after many years of service to the University and the General Hospital. Dr. S. J. Evelyn also leaves the teaching staff, but we may rest assured that neither of these well-known doctors will cease to be active in professional and university life. Dr. Brown has, since his own undergraduate days when he excelled in track competition, been a strong supporter of University athletics and has served for many years on the Athletic Directorate. Dr. T. H. Hodgson has given up his responsibilities on the active staff of the General Hospital for reasons of health, but we are very happy that he is continuing his services as an assistant in the Out-Patient Department. Dr. Hodgson has made valuable contributions to research in the field of glaucoma. Dr. Gordon Dale, the senior orthopaedic surgeon at Sunnybrook Hospital, has also retired. He will be remembered not only by his students, but with love and affection by that large group of service men who suffered loss of limb. No other surgeon in Canada has such a breadth of experience and sound judgment in the treatment and management of amputations.

Dr. Farquharson has spoken in his report of the deaths of three well-known teachers who were for many years members of the Department of Medicine, Dr. George Young, Dr. W. P. Warner, and Dr. John Hepburn. All were great teachers, all were individualists—men of great integrity, men devoted to medicine, and men who worked tirelessly to uphold the ideals of their profession. Dr. Young was on the one hand a kindly physician and an exemplary teacher of students, on the other hand active in medical associations and organizations which brought together laymen and doctors in an effort to improve the health of the nation. Dr. Warner was a first-rate physician and teacher, who without hesitation, in spite of indifferent health, joined H.M. forces in the Second World War, and ultimately became Director General of Treatment Services in the DVA, where he will ever be remembered for his splendid vision and practical achievement of a university-sponsored scheme of treatment services for the veterans of Canada. Dr. Hepburn, a youthful Scots immigrant, a member of a Canadian Highland regiment, returning with grievous wounds to take up the study of medicine after a lapse of ten years, was a brilliant undergraduate. He had a keen brain, a rapier wit, and worked always with the best interests of the students and patients at heart. When his health was anything but satisfactory, he assumed the presidency of the Royal College of Physicians and Surgeons of Canada. Dr. R. M. Wansbrough died very suddenly on duty early this year. He was at the time of his death Surgeon-in-Chief of the Hospital for Sick Children, and Associate Professor in the Department of Surgery. He was well aware of his indisposition, but he never was one to spare himself in the service of his country, his school, his hospital, or his patients. We mourn his early passing, and acknowledge his contribution to the teaching and practice of surgery.

The Dean of the Middlesex Hospital Medical School in the University of

London suggested some time ago that it would be of mutual advantage to the two schools to have an exchange at the level of the senior clinicians. Dr. Ian Macdonald went to the Middlesex last October and spent a month as a member of the staff of the hospital, engaged in teaching, clinical work and observing, as well as taking part in the everyday life of the hospital and school. He returned delighted with his reception and convinced of the value of the exchange. In April of this year, we were privileged to have the return visit of Mr. Vaughan Hudson, the senior surgeon of the Middlesex. He was appointed a visiting professor, and during part of his stay, while Professor Janes was absent, he acted as Surgeon-in-Chief of the Toronto General Hospital. It is expected that arrangements will be made during the coming year for a visit to the Middlesex of one of our senior surgeons.

We have had more than the usual number of visitors from abroad and from the United States during the session. Sir Harry Platt, the President of the Royal College of Surgeons, gave the Balfour Lecture. Mr. H. Osmond Clarke, orthopaedic surgeon from London, gave a lecture under the auspices of the Rotary Club, and visited the orthopaedic services of the hospitals. Dr. M. Edward Davis of Chicago gave the Phi Delta Epsilon Lecture. Dr. R. Caldeyro-Bercia of Montevideo lectured in the Department of Obstetrics and Gynaecology. Dr. René Fontaine of Strasbourg visited the hospitals and talked on his experiences in obstructive arterial disease and grafting operations for its relief.

The Medical Alumni Association has continued its active support and interest in all the work of the school. The amount of financial aid to students has steadily increased over the past ten years. The Association was host on the eve of graduation in Hart House to 21 members of the class of 1906, and to the majority of the members of the graduating class. Dr. Angus Campbell, Emeritus Professor of Otolaryngology, responded to the toast to the class of 1906.

The school again acknowledges gratefully the financial support for research and investigation from various government bodies such as the National Research Council, the Department of National Health and Welfare, the Defence Research Board, the Research Fund of the Department of Veterans Affairs. Grants in aid of research and support in the way of fellowships have been provided by the National Cancer Institute, the Ontario Cancer Research and Treatment Foundation, the Canadian Cancer Society (Ontario Division), the Canadian Arthritis and Rheumatism Society, the Canadian Life Insurance Officers Association, Dr. Wallace Duncan of Cleveland, the Bickell Foundation, the Atkinson Foundation, the Dominion Stores, and the Rotary Club. The R. S. McLaughlin Foundation has aided several young teachers and investigators, by providing financial support for a year's study abroad.

As in other years, the members of the staff have been the recipients of many honours. They have been elected to fellowship in learned societies on this continent and abroad, and many have been appointed to high office in the organizations associated with their specialty.

Dr. R. A. Gordon was elected to the Council of the World Federation of Societies of Anaesthesiologists. Dr. Code Smith was made a Fellow of the American College of Anaesthesiology. Professor J. V. Basmajian was elected a Fellow of the New York Academy of Sciences. Professor C. S. Hanes was elected a Fellow of the Royal Society of Canada and was appointed Walker-Ames Visiting Professor in the Department of Biochemistry, University of Washington.

Dr. Wallace Graham was elected to Fellowship in the Royal College of Physicians of London. Miss Norma Huber received the award for the outstanding paper presented at the First North American Conference of Medical Laboratory Technicians. Dr. G. A. Henry was appointed Oto-Laryngologist-in-chief at St. Michael's Hospital. Dr. P. E. Ireland has been elected President of the American Laryngological, Rhinological and Otological Society. He has also been appointed to the Council of the Royal College of Physicians and Surgeons of Canada. Dr. H. W. D. McCart has been elected Vice-President of the American Broncho-Esophagological Society. Dr. Kenneth McAskile has been elected a Fellow of the American Otological

Society, and Dr. J. K. B. Smith a Fellow of the American Laryngological, Rhinological and Otological Society.

Dr. J. H. Ebbs was elected President of the Canadian Paediatric Society. Dr. C. E. Snelling was elected State Chairman of the American Academy of Paediatrics, District V. Dr. R. E. Haist was appointed Chairman of the Panel on Shock and Plasma Expanders of the Defence Research Board, Vice-President of the Canadian Physiological Society, and First Vice-President of the Royal Canadian Institute. Dr. J. W. Scott was appointed editor of the *Bulletin of the Academy of Medicine*, and was elected Secretary-Treasurer of the Eastern Association of Electroencephalographers. Professor Erich Baer was elected a Fellow of the Royal Society of Canada, and of the American Association for the Advancement of Science. Professor Charles H. Best has been elected Honorary President of the Toronto Diabetes Association and a member of the Royal Danish Academy of Sciences and Letters. The British Diabetic Association has named their new Convalescent Unit "The Charles Best Home." Professor G. A. Wrenshall has been elected President of the Toronto Diabetes Association.

Dr. J. G. Dewan was elected to the Council of the Royal College of Physicians and Surgeons of Canada, and a Fellow of the American College of Physicians. Dr. A. B. Stokes is President of the Medico-Legal Society of Toronto, and President of the Ontario Neuropsychiatric Association. Mr. Farrell Toombs was invited to represent the University of Toronto in H.R.H. The Duke of Edinburgh's Study Conference on Human Problems in an Industrial Society at Oxford University. Dr. W. G. Gardiner was President of the Toronto Society of Physical Medicine and Rehabilitation. Professor J. D. Hamilton was admitted to the Royal College of Physicians as a Fellow under the special regulation relating to distinguished teachers and graduates of more than twenty years.

Dr. A. W. Farmer has been appointed Her Majesty's Honorary Surgeon for two years from June 1, 1956. Dr. R. I. Harris was made an Honorary Fellow of the Royal Australasian College of Surgeons. Dr. W. G. Bigelow was the first recipient of the Medal of the International Society of Surgery. Dr. J. A. MacFarlane received an Honorary Doctorate degree from the University of Brazil. He was also elected President of the National Cancer Institute of Canada.

The splendid and efficient work of the secretarial staff is again gratefully acknowledged, as is also the friendly and co-operative support of the administrative staff of the University in the departments of finance, buildings, and the office of the Registrar.

J. A. MacFarlane

Publications

OFFICE OF THE DEAN

MacFarlane, J. A. "The Medical School in a Canadian Community" (*Canadian Medical Association Journal*, vol. 73, no. 2, July 15, 1955, pp. 117–20).

Medical Society

(September, 1955 to June, 1956)

Honorary President	Dean J. A. MacFarlane
Honorary Secretary-Treasurer	Dr. A. L. Chute
Chairman	Dr. M. J. B. Stalker
President	W. S. Hunter
Vice-President	R. L. Hooper
Treasurer	D. C. Price
Secretary	Miss G. B. Pierce

The University of Toronto Medical Society has as its purpose to serve the welfare and interests of the medical undergraduate body, to encourage interest in general medical science and literature, to provide facilities for the comfort and convenience of the Society, and to publish a *Journal*. The Society consists of all undergraduate medical students, and is governed by the Medical Society Assembly, the annually elected executive body. The Society's business is conducted at bi-weekly meetings throughout the school year.

The freshman class was welcomed at the opening of the school year at a reception held in Falconer Hall, with Dr. E. H. Botterell as guest speaker, and a few Daffydilians for added entertainment. In order to make the freshman class more aware of their happy lot, plans have been made to include some work of a constructive nature as part of a more comprehensive and interesting programme.

A plan begun last year for better liaison with the other group of students in the Faculty, the Physical and Occupational Therapy undergraduates, was continued. A dance was held in the fall in Hart House, and the Osler Society, the Debates Club, and the *Journal* all had contributions from the "P & OTs".

The *Medical Journal*, now published monthly from November to April, again received the Frosst Trophy for the best undergraduate medical journal in Canada for the previous school year. A large number of student articles were obtained and each issue was devoted to a particular field of medicine, producing an interesting volume. The *Journal* gained in popularity over the year and also stabilized its financial position considerably.

The fall saw the operation of our new student common room, "The Duncan Room," at full scale for the first time. It has proven to be a very popular meeting place for the students and in particular those in the premedical and first medical years. It has served as a meeting place for several of the Society's groups and will continue to do so to our advantage. More furniture and curtains are needed and will be purchased for the next school session.

December is Daffydil time and once again this year Daffydil was considered the best of the campus shows. It provides many of the members of the Society with a creative outlet onstage and back stage, and continues to be one of the Society's most successful undertakings, everything from the songs to the skits being written and produced by the students. It gives enjoyment to graduates and undergraduates as well as many friends of the Faculty.

The annual Staff-Student Smoker was held in early February with many of the Faculty present. Efforts were made by the committee to increase the number of clinicians and lecturers, so that the students would have an opportunity to meet them informally. The speaker for the evening was Dr. K. G. Gray. The evening is very popular with those who attend and suggestions have been made for other evenings of this sort.

The Medical At-Home was held in the Royal York Hotel in late February, with the theme "Beyond the Bedside." Professional entertainment was provided this year and efforts will continue in planning to include a variety of attractions.

During the year the Arts and Letters Club carried out the programme of debates

and encouraged the Glee Club and Osler Society. The Osler Society was born four years ago of the interest of a large group of students in subjects of general interest related to medicine, and holds monthly meetings at which their papers are presented.

The *Probe*, the students' newsletter, begun a year ago, continued publication, bringing news of interest to all the years and reports on their activities.

The Staff-Student Curriculum Committee quietly maintained its activity of helping students help themselves with problems arising from their courses. The feeling is that the committee is effective in many ways, most important being the fact that the staff is made aware of our interest in improvement of our courses.

The Medical Society's activities include those of the Athletic Association and the Medical Women's Undergraduate Association, whose reports will be found below. The Students' Administrative Council has conducted a few activities with which the Society has co-operated, including the SHARE, the Blood Donor, the Float Parade and the WUS campaigns.

The Canadian Association of Medical Students and Internes (CAMSI) is also represented on the Assembly and has continued to carry out its business through our Assembly.

The above listed activities are largely those of an established nature, having been included in past years and continued because their value was appreciated. During this year it has been necessary to evaluate the function of the new Duncan Room, to re-consider the place of the freshman in our schedule of activities, to consider our finances in the light of the past five years' trends, and to alter slightly the constitution of the Society. In addition it was suggested to the Assembly-elect that some sort of social activity was needed of a type that could include all medical students. To start the programme, it was decided to hold a Fall dance. It was felt that this would help counter some of the apathy now present among the students towards the Society's activities. Attention is being given to this problem in other areas.

The ability to create Honored and Honorary members of the Society was used this year to show our appreciation to certain persons who have added to our school life. The following were elected: Honored Member—Dr. Wallace Duncan; Honorary Members—Mr. Charles Hart, Mr. Jack Martin, Miss Olive Russell and Mr. Harry Whittaker.

The Assembly enjoyed the chairmanship of Dr. John Stalker to whom we are indebted. May we pass on to our successors every good wish for the coming year.

W. S. HUNTER

Medical Athletic Association

(September, 1955 to June, 1956)

Honorary President	J. H. Ebbs
President	J. R. Wilkes
Vice-President	J. W. Hamilton
Secretary-Treasurer	R. E. A. Macdonald
Publicity Director	A. G. Cecutti
Quartermaster	L. E. Soper
IV Medical Representative	R. A. V. Arnold
III Medical Representative	R. J. Wheler
II Medical Representative	J. H. Fowler
I Medical Representative	L. D. J. Chisholm
II Premedical Representative	D. J. Gare
I Premedical Representative	P. B. Druckman

During 1955–6 the Medical Athletic Association again enjoyed a successful year with full intramural and intercollegiate participation from its members. Two intramural championships were won and our teams were very nearly victorious in others.

In the autumn our golf tournament was held and George deVeber of IV Meds came in with the lowest score, in a field somewhat limited due to cold wet fall weather. This tournament led off a series of athletic events which were to keep Meds athletes busy all year. Our football team missed getting into the second division playoffs by the loss of a very close game. Lacrosse, soccer, and track gave our men brawny physiques but no championships.

The winter months again provided the University with hockey at Varsity Arena. The experts predicted a sure win by the Senior Meds team, but alas their predictions went wrong and the Jennings Cup went to Trinity College. Our basketball teams failed to bring us a championship, but our hopes are high for the future.

It is interesting to note that the two Meds championships came from teams made up entirely from one class each. The Second Medical year now have a champion volleyball team within its ranks, and the graduation ceremonies will see the twice consecutive water-polo champions leave the University.

Our Annual Athletic Banquet was held this year at the Chez Paree restaurant and was a great success. Dr. Harry Ebbs gave us an entertaining speech, and the Medical M's were presented by Dean MacFarlane to some thirty Meds athletes. Special awards along with championship awards were also presented at this time.

Among many students who have helped our athletic cause is Les Soper who this year is relinquishing his job of Quartermaster. Under Mr. Soper the equipment during the past two years has been replenished, and is now in excellent repair. Many thanks to Mr. Soper.

The Medical Athletic Stick was won by Mr. B. A. Langer. The Association adopted a new method of awarding the stick and now it is handled by the graduating year instead of the Association Executive.

Although the T. A. Reed Trophy again escaped the enthusiastic Meds athletes, nevertheless we had a good year, and under the new President, Mr. J. W. Hamilton, our hope is that it will rest in the Medical Building at the end of 1957.

J. R. WILKES

Medical Women's Undergraduate Association

(September, 1955 to June, 1956)

Honorary President	Dr. Ethel Morgan
President	Margaret Stoute
Vice-President	Nancy Tuttle
S.A.C. Representative	Mary Robertson
Treasurer	Carole Broadhurst
Secretary	Sally Saunders
Social Convener	Carol Voaden
Chairman, Common Room Committee	Carolyn Cadbury

The activities of the Medical Women's Undergraduate Association have followed the pattern of previous years with two minor changes. First, we have started a library. We hope this project will grow so that eventually there will be an enjoyable source of good reading material for those members of the Medical years who wish to remain in contact with the Arts. As the books will be kept in the Common Room, the girls may browse through them in their leisure minutes. Our second innovation was that of holding five o'clock meetings at which a subject of interest could be discussed over a cup of tea. Dr. Ethel Morgan and Dr. Sheila Hill spoke on "Pathology as a Specialty" and "Internships Abroad" respectively. Both meetings were thoroughly enjoyed as was obvious from the attendance and lively discussions.

We were most fortunate this year in having Dr. Ethel Morgan as our Honorary

President. Dr. Morgan's friendship and interest were real assets to us and we are deeply grateful to her.

On opening day of term, the girls of the second premedical year helped the incoming girls to register and following this, the girls of the fourth medical year took the newcomers to lunch.

The undergraduates participated in numerous social functions. In September, the girls enjoyed the informal "get-together" with the Medical Women's Federation of Ontario at Dr. Marian Hilliard's home. In April, the Medical Women's Alumni of the University of Toronto entertained us at an afternoon tea.

Our annual Initiation Banquet was held in October at the Northgate Hotel. The graduates and undergraduates enjoyed listening to an amusing and informative after-dinner speech by Mrs. Luella Creighton, author of *High Bright Buggy Wheels* and *Turn East, Turn West.*

Just before the holidays the annual Christmas party was held and we again collected gifts for the Settlement House.

The Daffydil Committee again requested our assistance in preparing the food for the Daffydil party. This was ably supervised by Miss Mary Robertson.

We gave two of our Common Room chairs a "face lifting" by buying attractive covers for them. All the girls appreciated the improved appearance of the Common Room following the repainting last summer.

Miss Mary Robertson was our very capable representative on the Students' Administrative Council. Her work as a member of the Student Service Commission received much praise. An amusing and lively discussion on the legality of our eighty-odd girls electing their own SAC representative and at the same time voting for the men's representative took place at the final Medical Society meeting. The final decision was left in abeyance till next year but it was a popular opinion that the girl candidates be voted on by the whole student body.

Our sincere thanks are due to Louise Chevalier who directed an active athletic programme and also advised and assisted the Medical Women's Undergraduate Association in its projects.

Our closing activity was an afternoon tea at Miss Carolyn Cadbury's home at which time the graduating girls were honoured. The third medical year girls composed clever and amusing lyrics about the fourth medical year.

This year's activities on the whole were well supported and enjoyed, and for this much credit goes to the co-operation of all the Medical Women's Undergraduate Executive.

MARGARET STOUTE

Medical Women's Athletic Association

(September, 1955 to June, 1956)

President	Louise Chevalier
Vice-President	Doris Kerr
Treasurer	Ruth Groh
Secretary	Margaret Norman
I Premedical Representative	Ann Cuddy

Again this year we had a team competing in every sport played on the campus, despite the small number of girls from which to choose. Although our losses were more numerous than our victories, our aim—enjoyment and recreation—was more than fulfilled.

Basketball was again our best sport and we reached the finals at Hart House. We lost the Interfaculty Trophy by a margin of seven points in that final game. Our activities, apart from the competitions, consisted of a splash-party in the fall

and a skating party during the winter. Both were well attended and both were followed by lots of good food. A hilarious hockey game took place in February: Meds boys vs Meds girls. Because of the protecting and helping hand of two boys playing on the "skirts" side, the ladies won by a large margin. A revenge game is scheduled for next year.

The annual Medical Women's Athletic Association Banquet ended our activities early in March. It was held in Chinatown with an all Chinese menu and the attendance was a record one. Dr. Cam Gray was our guest speaker and was highly applauded. Dr. Marjorie Platts, our past president, gave the awards which consisted of two premed Bars; four Medical M's; two Third Colors; four Junior T's; one Senior T; and one Silver Award, the last-named being the new award created this year by the Women's Athletic Directorate of the University and now the highest athletic award.

My personal thanks go to the Executive of 1955–6 for their interest and co-operation, and best wishes for a successful year to the newly elected one of 1956–7.

LOUISE CHEVALIER

Science-Medicine Division of the University Library

Reported by Mrs. M. Galt

The use of the Library by staff and students has been very satisfactory; especially worth mentioning is the increasing interest in current periodicals.

The survey of the medical collection being made by members of the teaching staff should be completed shortly, thanks to the splendid work of the co-operating departments. Many of the books and journals recommended are in the process of being checked and ordered; this project should be completed next year, bringing the collection up to date, and thus making it much more valuable to staff, graduates, and students.

Under the auspices of the British Council, a medical book exhibit was held in January. The interest in the display was most gratifying. Eventually the books will be distributed among the participating Canadian medical schools.

The Editor of the *Canadian Medical Association Journal* has contributed a number of recent books, which members of the staff have very kindly reviewed for the journal and presented to the Library.

FELLOWSHIPS, SCHOLARSHIPS, MEDALS AND PRIZES

Awarded at Convocation, June, 1956

GRADUATE

Graham Campbell Fellowship	B. Balshin, M.D.
Graham Campbell Prize	D. P. Bryce, M.D., F.R.C.S.(C)
William Edward Gallie Travel Award	D. J. Currie, M.D., M.Sc., F.R.C.S.(Ed.), F.R.C.S.(C)
William Goldie Prize	J. C. Laidlaw, M.D., M.A., Ph.D., F.R.C.P.(C)
Roscoe Reid Graham Travelling Fellowship	J. E. Mullens, M.D., F.R.C.S.(C)
Percy Hermant Fellowships in Ophthalmology	B. M. Bradley, M.D. J. Dumas, M.D.
Arch Hutchison Fellowship	K. R. Butler, M.D.
Lister Prize in Surgery	Ian Todd, M.D., F.R.C.S. (Eng.)

O'Keefe Fellowships in Oto-Laryngology	T. Molony, L.R.C.P. & S., F.R.C.S.(C) G. E. D. Snell, M.D.
Starr Medals	J. V. Basmajian, M.D. D. Kumar, M.B., B.S.

UNDERGRADUATE

Fourth Medical Year

Cody Gold Medal	B. Langer
Cody Silver Medal	W. F. Neale
Cody Silver Medal	J. Q. Bliss
Doctor Benjamin W. Appleton Prize in Psychiatry	B. Langer
Butterworth Prize	T. Izukawa
Chappell Prize in Clinical Medicine	B. Langer
Hendry Memorial Scholarship	D. H. Cowan
Medical Alumni Association Scholarship	B. Langer
Ellen Mickle Fellowship	B. Langer *Aeq.* W. F. Neale
Ontario Medical Association Prize in Preventive Medicine	J. Q. Bliss
Doctor Roy Simpson Scholarship in Paediatrics	E. B. M. Challis
Class of 1924 War Service Scholarship	R. W. Ridge

Third Medical Year

Doctor Benjamin Cohen Prize in Obstetrics	J. A. Lowden
Franckel Memorial Award	A. B. Tennen
J. F. Hartz Company Prize in Ophthalmology	H. M. Taylor
J. F. Hartz Company Prize in Oto-Laryngology	L. H. Mudie
Frank W. Horner Gold Medal	S. B. Venis
Ronald S. Saddington Medal in Pathology	A. B. Tennen
Starkman Prize in Pharmacology and Therapeutics	D. Glick
Alexander McPhedran Award	P. Irwin

Second Medical Year

John Copp Bursary	D. C. Price
Posluns Brothers Scholarship	G. G. Forstner
Sandoz Prize in Pharmacology	S. Sidlofsky

First Medical Year

John Zoberman Scholarship	H. Schachter

Second Premedical Year

Famous Players Canadian Corporation Scholarship	M. F. Zane

REPORT ON REGISTRATION, SESSION 1956–7

First premedical year	134
Second premedical year	121
First medical year	149
Second medical year	152
Third medical year	124
Fourth medical year	140
Occasionals	4
Art as Applied to Medicine	5
Bachelor of Science (Medicine)	3
Diploma in Medical Radiology	18
Diploma in Psychiatry	37
Diploma in Public Health	17
Diploma in Industrial Hygiene	4
Graduate students (including 79 in the advanced graduate course)	279
	1,187
Physical and Occupational Therapy	206

Anaesthesia

Under the direction of Professor S. M. Campbell

The undergraduate teaching followed the same lines as in the previous year. Sixteen lectures and clinics were given the third-year students; individual instruction in the operating rooms and oral examinations were given in the fourth year. Consideration is being given to having each fourth-year student stay with an instructor wherever the staff anaesthetist may go to give anaesthetics during the week the student is assigned to anaesthesia, rather than having him haphazardly pick up instruction during that week. This should produce a closer relationship between the student and the teacher, and be of much greater benefit.

Eighteen men and women have been in the two-year postgraduate course, and two others have been taking a third year as resident fellows at the Toronto General and Hospital for Sick Children. The number of applications for entry into the course has been greater than we have been able to accept although there is a slight increase each year in the available appointments.

The Department is very grateful for the co-operation and instruction given by members of all the other departments, both basic science and clinical, in carrying out the teaching programme.

During the year there were many visitors, amongst whom were Dr. Geoffrey Organe, Westminster Hospital, London, England; Dr. Otto Mollestad, University of Oslo, Norway; Dr. C. R. Ritsema van Eck, University of Groningen, Holland; Dr. Norman James, University of Melbourne, Australia; Dr. Dundee, Liverpool, England.

In August and September 1955 the Head of the Department visited the Departments of Anaesthesia at Glasgow, Edinburgh, Oxford, Oslo, and Stockholm. Drs. Campbell, Gordon, and Shields attended the first meeting of the World Congress of Societies of Anaesthetists at Scheveningen, Holland, in September 1955.

Dr. Margaret Dewan of St. Michael's Hospital was given leave of absence for six months for study abroad, and has had an appointment for six months at the Royal Infirmary, Bristol, England.

We record, with regret, the retirement from the Department this year of Dr. W. Easson Brown and Dr. Stephen J. Evelyn. Both have been excellent teachers, and have always been very faithful in giving their services to the students.

Members of the staff gave numerous papers and addresses at scientific meetings: Dr. S. M. Campbell: "The Teaching of Anaesthesia in a Canadian University," a paper read at the World Congress of Societies of Anesthesiologists, Scheveningen, Holland, September 8–12, 1955; "The Use of Hypothermia with Anaesthesia for Cardiac Surgery" and "The Choice of Anaesthesia for Patients with Cardiac Disabilities," papers read at the meetings of the Nova Scotia Division of the Canadian Anaesthetists' Society, Halifax, November 8 and 9, 1955; "Experience with Hypothermia at the Toronto General Hospital," at the Academy of Anesthesiology, Hartford, Conn., October, 1955, and the meeting of the Canadian Anaesthetists' Society, Mont Tremblant, P.Q., June 19, 1956. Dr. R. A. Gordon: "Experience with Hypothermia at the Toronto General Hospital," at the Academy of Anesthesiology, Hartford, Conn., October, 1955; "A Survey of Canadian Anaesthesia," at the Western Division, Canadian Anaesthetists' Society, Vancouver, B.C.; "Anaesthesia for Mass Casualties," Civil Defence College, Arnprior, Ont., March 8, 1956; "Clinical Evaluation of Viadril," Canadian Anaesthetists' Society Meeting, Mont Tremblant, P.Q., June 18, 1956. Dr. C. I. Junkin: "Anaesthesia for Surgery of the Neonatal Period," before the Academy of Anesthesiology, Hartford, Conn., October, 1955; Dr. Code Smith, "Design of a Simple Clinical Experiment," Western Division, Canadian Anaesthetists' Society, Vancouver, B.C., April, 1956; "The Phenothiazine Derivatives in Paediatric Anaesthesia," Western Division, Canadian Anaesthetists' Society, Vancouver, B.C., April, 1956; "Techniques in Paediatric Anaesthesia," Manitoba Division, Canadian Anaesthetists' Society, May, 1956. Dr. S. L. Vandewater: "Observa-

tions on Blood PH and CO2 Combining Power in Hypothermia," Canadian Neurological Society Meeting, Quebec City, June, 1956.

Research

Members of the staff have undertaken the following clinical research:

Dr. S. M. Campbell, with the assistance of Dr. Ian Harper and Dr. W. A. Renwick, has been evaluating the use of a non-barbiturate intravenous anaesthetic "Dolitrone."

Dr. H. Barrie Fairley and Dr. S. M. Campbell have collaborated with Dr. W. G. Bigelow in a study of methods of anaesthesia and hypothermia for cardiovascular surgery.

Dr. Shirley Fleming and Dr. J. G. Robinson investigated the use of a new barbiturate, Neraval, as an intravenous anaesthetic.

Dr. R. A. Gordon and Dr. Michael Campbell have continued an investigation into methods of control of intractable pain in terminal carcinoma with particular reference to the use of Chlorpromazine. This research was supported by a grant from the Ontario Cancer Treatment and Research Foundation. In association with Dr. W. Allemang of the Department of Obstetrics and Gynaecology, investigation was continued on "The use of Chlorpromazine in analgesia for obstetrics." In association with Dr. W. Lunderville an investigation was carried out on the use of a new drug of the steroid group (Viadril), as an intravenous anaesthetic.

Dr. Iain MacKay carried out a short investigation into the pH of the blood of anaesthetized patients under various types of respiratory control.

Dr. Code Smith and associates, working with Dr. Wm. Mustard at the Hospital for Sick Children, have continued a study of anaesthetic procedures associated with hypothermia in children, and with the "Blood pump, monkey lung, cardiac by-pass."

Dr. S. L. Vandewater has been associated with the Department of Neurosurgery, under Dr. E. H. Botterell, in developing anaesthetic and hypothermic technique for intracranial vascular surgery. This has been a highly successful and outstanding piece of work.

Publications

Conn, A. W. "Acute Laryngotracheobronchitis" (*Canadian Anaesthetists' Society Journal*, vol. 2, no. 4, Oct., 1955, pp. 247–50).

Gordon, R. A. "Ventilation in Anaesthesia"; editorial (*ibid.*, vol. 3, no. 2, April, 1956, p. 79).

——— "The World Federation of Societies of Anesthesiologists"; editorial (*ibid.*, vol. 3, no. 1, Jan., 1956, p. 1).

MacKay, I. M. "A New Manual Respirator" (*ibid.*, vol. 3, no. 2, April, 1956, pp. 113–16).

Shields, H. J. "The History of Anaesthesia in Canada" (*ibid.*, vol. 2, no. 4, pp. 301–07).

Smith, Code. "Anaesthesia for the Surgical Correction of Congenital Heart Disease" (*ibid.*, vol. 2, no. 4, Oct., 1955, pp. 347–53).

Vandewater, S. L. "Advantages of Induced Hypotension" (*ibid.*, vol. 3, no. 2, April, 1956, pp. 131–4).

Vandewater, S. L., Botterell, E. H., and Lougheed, W. M. "A Method of Anaesthesia and Hypothermia in Cerebral Vascular Surgery" (*ibid.*, vol. 2, no. 4, Oct., 1955, pp. 319–26).

Whalen, J. S. "Emergency Paediatric Anaesthesia" (*ibid.*, vol. 2, no. 4, Oct., 1955, pp. 366–72).

Anatomy

Under the direction of Professor J. C. B. Grant

During the year 1955–6 there were 662 undergraduate and graduate students working in the Department of Anatomy. They were distributed among the twenty-two courses mentioned below, as follows:

UNDERGRADUATE COURSES IN GROSS ANATOMY AND NEURO-ANATOMY:		
1. Medical, first year	156	
Art as Applied to Medicine	2	
Teachers' Course, Physical and Occupational Therapy	1	
2. Dental, first year	76	
3. Physical and Occupational Therapy, first year	70	
4. Physical and Occupational Therapy, second year	81	
5. Physical and Health Education, first year	48	
6. Physical and Health Education, second year	34	
7. School of Embalming (Spring)	70	
8. Dental Hygiene, first year	11	
		549
GRADUATE COURSES IN GROSS ANATOMY:		
9. M.S., F.R.C.S., Radiology, and Anaesthesiology (evening courses)	40	
10. Ophthalmology	6	
11. Oto-Laryngology	7	
12. Dental Specialties	5	
13. Demonstrators of Anatomy	2	
14. Advanced Graduate Course in Surgery	28	
15. Advanced Graduate Course in Obstetrics and Gynaecology (Autumn)	11	
16. M.A., Ph.D.	2	
		101
UNDERGRADUATE COURSES IN HISTOLOGY:		
17. Medical, first year (included in item 1)	156	
18. Dental, first year (included in item 2)	76	
19. Physical and Occupational Therapy, first year (included in item 3)	70	
GRADUATE COURSES IN HISTOLOGY AND CYTOLOGY:		
20. Graduate Dental Histology	5	
21. Graduate Histology	5	
22. Demonstrator in Histology	1	11
		661

As has been stated in previous reports, it is constantly hoped by all members of the teaching staff of the Department that means will be found to introduce the subject of Anatomy into the second premedical year, not in order that more Anatomy may be taught but that the students may be instructed in the subject over a longer period of time. Two lecture-demonstrations a week, or even one, given by a member of the staff of the Department in the Department would be welcomed by the students who would then feel that they had actually embarked on their medical curriculum, and on their life's career. There need be no examination, so this need be no burden. Time has shown that it has not been wise to endeavour to compress the subject of Anatomy, previously taught in two years, into one year.

It has been accepted by the Faculty Council and stated in the Calendar that "Any optional subject taken in the first premedical year must be continued into the second premedical year." If this general principle applies to optional subjects, much more, surely, must it apply to essential subjects. If this principle were put consistently into force, time could then be found to introduce once again into the first medical year Applied or Clinical Anatomy, given in former years so acceptably by clinicians in the hospital and only abandoned from lack of time.

Last October, each of the medical schools in the United States of America and in Canada was represented at the so-called "Third Teaching Institute," sponsored by the Association of American Medical Colleges and held in Swampscott, Massachusetts. This was, in reality, an elaborately and skilfully prepared conference of teachers of Anatomy and Anthropology on teaching and on methods of teaching. (Of the two preceding Institutes, one dealt with Physiology and the other with Pathology.)

Dr. J. W. A. Duckworth and Dr. Sylvia H. Bensley represented the Department of Anatomy of this University. Dr. Duckworth acted as Chairman of one of the sessions on the Teaching of Anatomy. Dr. Bensley was appointed to one of the planning committees and took part in the discussions.

At the annual meetings of the American Association of Anatomists held in Milwaukee, Wisconsin, in April, Dr. Bensley gave a demonstration of "Liver Tumor Cells Implanted in the Anterior Chamber of the Eye" and a paper at the Symposium on the Teaching of Histology.

Dr. A. W. Ham was a guest-speaker last September at the Dedication Program for the Hospital for Special Surgery in New York, at which time he gave an address on the general subject of how the blood-supply and the system of nutrition in bone is related to its growth, repair, and transplantation. In May, he gave a similar address in Toronto to the Annual Meeting of the American Association for Plastic Surgeons. In December, Dr. Ham took part in the Second Annual Seminar of the Rowe Smith Memorial Foundation on "The Physiology and Pathology of Bone as Applied to Dental Practice" with an address entitled "The Formation of Bone." This Seminar was held in Karnack, Texas.

Dr. Ham has been appointed Head of the Section on Biological Research in the new Ontario Cancer Institute on Sherbourne Street, but this does not sever his connection with the Department of Anatomy.

Dr. J. V. Basmajian has co-operated with the Department of Orthodontics in setting up their electromyographic laboratory, and he has acted as an adviser in the investigations of Dr. R. Boyko, studying for the M.Sc.D. degree in that Department. He was awarded a Starr Medal in Anatomy. He was elected a Fellow of the New York Academy of Sciences.

During the past year Dr. A. Latif, a Colombo Plan Fellow from Pakistan, studied under Dr. Basmajian and completed his M.A. degree.

Dr. A. F. Howatson, on invitation, visited recently Dr. Leblond's laboratories at McGill University and the Montreal Cancer Institute, in order to give three lectures describing his recent electron microscope studies of the finer structure of tumour cells and cells from the bone marrow of leukaemic patients. With Dr. Ham, he is giving a joint paper at the Second Canadian Cancer Conference at Honey Harbour in June.

At the end of this academic year, 1955–6, Professor J. C. Watt and the writer of this report cease to be members of the teaching staff of this University. Also retiring at this time is Mr. H. McCormick, Chief Technician in the Department.

Dr. Watt graduated B.A. (Toronto) in 1908, and M.B. in 1910, the gold medallist of his year. He was immediately invited to join the staff of the Department of Anatomy under Professor McMurrich. This invitation he accepted, and he has served on the staff of the Department ever since, that is for a continuous period of forty-six years. He soon acquired the twin postgraduate degrees, M.A. and M.D., conferred on him at the same convocation for research work on various phases of Embryology.

Mr. H. McCormick, popularly known as "Mac" to the students of this Faculty since 1917, has, like Dr. Watt, given both long and loyal, and cheerful and devoted service to the Department, and they have in different ways notably contributed to its growth through two generations.

The writer considers himself very fortunate in the presidents and deans under whom he has served in this University, and also in his colleagues and students. He must be ever grateful that his lot was cast in the University of Toronto where he has had the opportunity to follow his chosen profession. It is with much pleasure that he learns that John W. A. Duckworth, M.D. (Edinburgh) has been appointed to succeed him in the Chair.

Research

Dr. J. V. Basmajian's electromyographic studies have been continually expanded. During the past year, in addition to various smaller studies, he has been engaged in the following specific programmes:

(1) With Dr. A. Latif, an experimental study of the flexors of the elbow, and of the temporal muscle in normal persons.

(2) With Mr. J. Kraicer, Lederle student-fellow, an experimental study of spasticity and the effects of Chlorpromazine in the rabbit. Unlike the result in human beings, there was no effect in a series of rabbits with chronic spasticity caused by transection of the spinal cord.

(3) With the Muscular Dystrophy Research Group at the Hospital for Sick Children, a continuing study of neuro-muscular diseases.

With the aid of a grant from the Banting Research Foundation, Dr. Sylvia H. Bensley is studying the effect of sex hormones on the action of histamine and hyaluronidase in guinea-pigs. It was found that 9 mg. of histamine injected subcutaneously was the LD/50 dose in histamine-sensitive strains. Three intramuscular injections of 1 mg. of testosterone over a period of a week protected male (but not female) guinea-pigs against death from histamine shock. A mixture of histamine and hyaluronidase was three times as lethal as histamine alone. Moreover, this combination produced a marked progressive peripheral swelling which was not produced by either substance alone. Three intramuscular injections of 3 mg. of testosterone over a period of a week prevented the progressive swelling produced by histamine plus hyaluronidase but not death from histamine shock. Larger quantities of sex hormone modified or prevented the histamine shock as well. Histological studies are under way to determine the mechanism of these phenomena.

Dr. J. W. A. Duckworth has been engaged during the past year in investigating the innervation of the sinu-atrial and atrioventricular nodes in the heart of the Rhesus monkey, using a silver proteinate stain. The work to date indicates that both the sinu-atrial and atrioventricular nodes are much more heavily innervated than the ordinary heart muscle.

Dr. Ham, Dr. Howatson, Mr. G. Ross, and Mr. R. Varvarande of this Department collaborated with Dr. J. Barlow of the Banting and Best Department of Medical Research and Dr. E. A. McCulloch, a fellow of the National Cancer Institute, in making a histological study of the day-to-day changes in the tissues of mice following total body radiation and in comparing these with the changes seen in mice given the same amount of radiation but, in addition, intravenous injections of bone marrow from non-radiated mice. Very striking changes were seen in sections of bone marrow in the first few days following radiation; the cells of the erythrocyte and myeloid series almost all disappeared. The sinusoids were not only congested but the appearances seen in most suggested an almost complete cessation of circulation in them for several days following the injury. The intravenous injection of bone marrow to the radiated mice, as has been shown by others, speeded the recovery of the marrow.

In an attempt to settle the question as to whether osteoclasts and foreign body giant cells have a different origin, Dr. Gordon Dale made an extensive study of the formation of giant cells around agar that was injected into the subcutaneous tissues of rabbits, and of the formation of osteoclasts around bone chips placed in the same environment, in rabbits vitally stained with trypan blue. The results of this study suggest that this method of establishing the origin of these cells, on which confidence has been placed in the past, is an uncertain one.

Dr. George Goodman, working on a part-time basis, has studied the effects of transplanting an adenocarcinoma from C57 mice into C3H mice (where it grows only temporarily) before and after the latter develop spontaneous breast tumours. Preliminary results are interesting but more work must be done before sound conclusions can be drawn from this experiment.

Dr. Alan F. Howatson, in co-operation with other members of this Department and with members of other departments of the University, has made a number of electron microscope studies. In these Mr. R. Varvarande has rendered valuable assistance. Among the more important projects are the following:

(1) With Dr. E. A. McCulloch, a comprehensive study is being made of the

fine structure of the cells of human bone marrow, obtained by sternal puncture from normal and leukaemic patients. Some of the findings arising from this study were presented in the form of a demonstration at the 1956 meeting of the American Association of Anatomists.

(2) With Dr. Manery Fisher and Miss Anne Robertson, studies have been made on the muscle of the pigeon's breast with particular reference to the structure of the mitochondria. A short report on this work was presented at the Arden House Conference on Tissue Fine Structure.

(3) With Mr. T. B. Bojarski, an investigation is being made of the morphological characteristics of the nuclear, mitochondrial and microsomal fractions obtained from rat liver by the methods commonly used for biochemical analysis. Corresponding fractions isolated from hepatomas have also been studied. It is hoped that these studies will help to clarify some of the biochemical findings.

Publications

Basmajian, J. V. "The Main Arteries of the Large Intestine" (*Surgery, Gynecology and Obstetrics*, vol. 101, Nov., 1955, pp. 585–91).

Basmajian, J. V. and Szatmari, A. "Chlorpromazine and Human Spasticity: An Electromyographic Study" (*Neurology*, vol. 5, Dec., 1955, pp. 856–60).

Bensley, Sylvia H. "Liver Tumor Cells in the Anterior Chamber of the Eye"; abstract (*Anatomical Record*, vol. 124, supplement, 1956, p. 451).

——— "Some Factors Involved in Histamine-induced Arthritis and Rheumatism in Animals" (*Proceedings of the First Canadian Conference on Research in Rheumatic Diseases*, 1955, pp. 61–4).

Bensley, Sylvia H. and Stevens, Patricia F. "Histological Studies of the Adrenal Glands after Repeated Injections of Histamine in Albino Mice" (*Anatomical Record*, vol. 123, 1955, pp. 227–37).

Howatson, A. F. and McCulloch, E. A. "The Fine Structure of Normal and Leukemic Marrow Cells"; abstract (*Anatomical Record*, vol. 124, 1956, p. 460).

Smith, C. G. "Changes in Length and Position of the Segments of the Spinal Cord with Changes in Posture in the Monkey" (*Radiology*, vol. 66, 1956, pp. 259–66).

Art as Applied to Medicine

Under the direction of Miss M. T. Wishart

The students numbered seven, five Canadians and two Americans. Three acquired their diplomas at the Spring Convocation.

The closer relationship with the students due to the proximity of their classrooms is showing results. Their work begins to reflect a certain concept of those elusive qualities which spark progress. This is owing also, in no small measure, to their instructors' efforts to instil initiative along with accepted precepts.

The second- and third-year students designed and constructed an exhibit of their work for display at the Ontario Medical Association meeting held in Toronto. The exhibit was entitled, "The trained medical artist can help you." It was shown also at the Hospital for Sick Children, Toronto.

Mr. Nicholas Mackovak, B.Sc., M.A., a 1954 graduate of the School of Medical Illustration, Massachusetts General Hospital, Boston, was appointed Frosst Fellow in the Department 1955–6. Sincere appreciation of the generous donation on the part of the Frosst Company, which has been maintained for the past eight years, is expressed.

Among interested visitors to the Department were Dr. J. Wendell Macleod, Dean of Medicine, University of Saskatchewan and Dr. J. F. McCreary, Professor of Paediatrics, University of British Columbia.

Miss Elizabeth Blackstock completed illustrations for Dr. W. G. de Haas on the

"Observation of the blood supply of long bones." Dr. de Haas presented a paper on this subject before the Academy of Medicine in April.

Dr. W. Anderson's report to the National Research Council on "A Study of degenerative joint changes with special reference to the shoulder" was another subject of interest illustrated by Miss Blackstock.

In September Miss Wishart, as Chairman of the Council on Education, attended a meeting of the Association of Medical Illustrators held at Columbia University, New York City.

In October Miss Wishart addressed the Ontario Association of Medical Record Librarians on the subject of "Medical Illustration," at their annual convention held in conjunction with the Ontario Hospital Association, Toronto.

The extent of the illustrative work undertaken compared favourably with that of other years. Illustrations have been prepared for many scientific meetings and publications.

Publications

Wishart, M. T. "Educational Development from 1950 to 1955" (*Journal of the Association of Medical Illustrators*, no. 8, 1956, pp. 48–9).

Bacteriology

Under the direction of Professor Philip Greey

The teaching time-table for Bacteriology in the second medical year now consists of sixteen lectures and laboratory periods in both the first and the second terms, with eight lectures in the third term. It is felt that this alteration in the distribution of the lecture and laboratory periods in the first and second terms has improved the presentation and assimilation of the subject. However, additional experience will be required before one can be certain.

Early in 1956, Dr. C. E. van Rooyen resigned to become Head of the Department of Bacteriology at Dalhousie University. Dr. van Rooyen's association with our department resulted in greater emphasis on the teaching of virology and on research. The stimulation of his fertile brain will be missed.

For some years Dr. van Rooyen has been interested in the problem of infectious hepatitis. Extensive field surveys of the disease in the rural communities and cities of Ontario have been conducted and numerous attempts to isolate the causative agent through tissue culture and other techniques have been made. This research programme is supported by the Defence Research Board and a Public Health Grant and has been conducted in the Connaught Medical Research Laboratories. Prior to Dr. van Rooyen's departure for Nova Scotia, arrangements were completed for this project to be moved to the Department of Bacteriology and housed in the Banting and Best Institutes. Dr. J. C. Sinclair of the Department of Medicine is now in charge of the work with A. E. Franklin, Ph.D., and Miss Barbara Buchner heading the group engaged in the tissue culture and other studies.

Dr. van Rooyen will still continue to be closely associated with the project. Dr. Franklin assisted in the teaching of virology during the past session.

Research

Members of the staff have undertaken the following research work:

Dr. R. M. Price has continued her interest in prophylactic vaccination against tuberculosis, with particular reference to methods and resultant allergy.

Dr. G. H. Hawks, at St. Michael's Hospital, is investigating the antistreptolysin titres in selected cases and in studying the blood concentration of penicillin following the oral administration of crystalline penicillin G and penicillin V.

Dr. T. E. Roy, at the Hospital for Sick Children, has completed a study of the sensitivity to antibiotics of the various aetiological agents encountered in childhood infections. He is investigating the problem of nasal carriers of staphylococcus aureus among nursing personnel and endeavouring to elucidate some of the various factors which may contribute to an understanding of the observation that some people continually harbour the micro-organism in the nose whereas others never do so.

Dr. Marion Ross, at Sunnybrook Hospital, is continuing a study of the anti-streptolysin titres in patients with chronic rheumatic heart disease.

In co-operation with Dr. W. B. Spaulding, Department of Medicine, a study of cat scratch disease is being continued. Antigens suitable for skin testing have been prepared and are being investigated fully. Miss Hennessy is endeavouring to isolate the causative agent by tissue culture techniques. Two further cases of paratyphoid fever due to Salmonella paratyphosus A have been encountered. This is a most unusual infection in Ontario and in both instances the micro-organism had been acquired during a vacation in Mexico. Laboratory space was again provided for serological tests used in relation to patients with acquired haemolytic anaemia, under the supervision of Dr. G. D. Hart, Department of Therapeutics.

The research group under the direction of Dr. H. L. Ormsby, Department of Ophthalmology, continue the study of ocular diseases of virus aetiology, which is described in the report of the Department of Ophthalmology.

Under the supervision of Dr. J. C. Sinclair, Department of Medicine, studies are being continued on infectious hepatitis. Clinical cases are investigated by Dr. Sinclair and Dr. Rutherdale. Dr. A. E. Franklin and Miss Barbara Buchner are endeavouring to isolate and identify the causative agent through tissue culture and other techniques, assisted by Mrs. Oke, Miss Mona Snyder, Mrs. Ward and Mr. Clifford Brunt. They are presently exploring the suggestion that the causative agent can be propagated on the tissue culture cell strain known as "Detroit 6."

Publications

Greey, Philip. "Infection Due to Salmonella paratyphi A.: Case Report" (*Canadian Journal of Microbiology*, vol. 2, no. 3, May, 1956, pp. 343–5).

Biochemistry

Under the direction of Professor A. M. Wynne

The distribution of the students working in the Department of Biochemistry in 1955–6 and in the preceding session was as follows:

	1955–1956	*1954–1955*
Faculty of Medicine: first medical year	148	124
Faculty of Arts: third and fourth years	47	43
Faculty of Dentistry: second dental year	80	89
Faculty of Household Science: third and fourth years	1	14
Occasional Students	3	0
School of Graduate Studies	53	56
Total	332	326

Seven other students in the first medical year were granted exemption from all examinations in biochemistry in 1955–6 because of their previous training in this subject, either as students in the Physiology and Biochemistry course in this University or as students in other universities.

Twenty-five students were enrolled in the School of Graduate Studies for the study of biochemistry as their major subject. Of these, 14 were proceeding towards the degree of Ph.D. and 7 towards the M.A. degree, while 4 others were not yet qualified for enrolment as candidates for a higher degree. Three students received

the degree of Ph.D. at the November convocation. The other 28 graduate students who received instruction in biochemistry were registered in other departments for their major studies.

The facilities for research in the Department have been greatly improved by the acquisition of several rooms on the second floor of the Medical Building, formerly occupied by the Department of Physiology and now refurnished and equipped as laboratories for biochemical research. The rooms so altered are numbered as follows: 201–202–203, 205–206, 207–208, 226–227. Professor Crocker and Professor Fisher, with their graduate students and assistants, moved into the new laboratories late in 1955 and have found them very satisfactory indeed. A new wash-room and a new machine-shop on the second floor have been provided also, in addition to greatly improved cold room facilities. We are very grateful to all who co-operated in providing these splendid improvements.

During the session Dr. E. F. Gale, F.R.S., and Dr. F. Sanger, F.R.S., both of the University of Cambridge, visited the Department as Visiting Lecturers in the School of Graduate Studies. In a lecture delivered before a large audience Dr. Gale discussed recent studies on the relation between protein-synthesis in biological systems and nucleic acids and their derivatives. Dr. Sanger, whose investigations have led to what appears to be a complete understanding of the sequence of the amino acids in the insulin molecule, lectured on the subject of protein structure.

Professor C. S. Hanes was appointed Walker-Ames Visiting Professor, for the spring term 1956, in the Department of Biochemistry in the University of Washington, Seattle.

Mrs. Rose Sheinin who has been engaged in research in the Department as a Fellow of the National Cancer Institute of Canada has been awarded a British Empire Cancer Campaign Fellowship. She will continue her researches in the University of Cambridge.

The programme of research which is described later was made possible through generous financial assistance received from the University's Advisory Committee on Research, the Banting Research Foundation, the J. P. Bickell Foundation, the Foster Bequest, the Insulin Fund, the National Cancer Institute of Canada, the National Research Council, and the Ontario Research Foundation.

Research

Professor G. C. Butler, with a group of graduate students, has pursued still further the investigation of problems in the complex field of study represented by nucleic acids, nucleohistones, nucleotides and related substances. One of his students, Miss R. Diringer, has been attempting to isolate in pure form and to identify an unknown compound which has been found in enzymic hydrolysates of deoxyribonucleates. Another student, Mrs. S. Hu, has studied the synthesis and the utilization of nucleotides in *Escherichia coli.* Mr. J. M. Neelin has examined new procedures for the isolation of histone from deoxyribonucleoprotein. Assisted by Miss V. Kask, Dr. Butler has studied the enzymic hydrolysis of ribonucleate.

Under Dr. Butler's direction, Mr. G. H. Kinsman has continued his work on uridine diphosphate glucose, a compound which has been shown recently to be related very closely to certain phases of carbohydrate metabolism. Mr. Kinsman has developed satisfactory methods for the synthesis of this compound containing glucose labelled with C^{14}, and he has devised procedures for the isolation of the compound from reaction mixtures and from natural sources.

Professor B. F. Crocker and his graduate students have investigated several aspects of the problem of the mechanism of the synthesis of enzymes in *Escherichia coli B.* Miss D. Michener has studied the nature of the reactions occurring during "pretreatment-induction," a procedure developed in this laboratory by Dr. C. J. Porter. She has found that under the conditions of her experiments the rapid and constant rate of enzyme-formation does not depend on the assimilation of the in-

ducer prior to the synthesis of enzyme. The question of the necessity for prior assimilation of sources of nitrogen and carbon is under investigation. Mr. R. Holmes concluded a study of the induced formation of β-galactosidase by *E. coli*. Mrs. R. Sheinin has studied the metabolic processes by which an externally applied inducer is converted into the active inducer. She has shown that, when the two galactosidases (α and β) are synthesized concurrently by *E. coli* in the presence of a single inducer, the α-enzyme resides on the surface of the cell whereas the β-enzyme is situated in its interior. Miss J. Taylor has investigated the kinetics of the induction of enzyme-formation with a view to identifying the rate-limiting step and so demonstrating by an independent method the necessity for the conversion of an externally applied inducer into a derivative which is the active form.

In Professor J. Manery Fisher's laboratory, studies on the relation between metabolic processes and the active transport of inorganic ions in biological systems have been continued. In extension of previous investigations, conducted by Miss K. E. Toye and others, on the stimulation by insulin of the consumption of oxygen and the uptake of potassium by frog-muscle in the presence of lactate, Dr. J. W. Meakin has shown that the observed effects of insulin and lactate are not influenced by appreciable changes in the pH of the medium. And the effects of insulin and lactate can be observed even though the medium contains no detectable inorganic phosphate. Through the kindness of the Director of the Connaught Medical Research Laboratories, Mr. H. Husdan has had access to plentiful supplies of brain-tissue removed from Rhesus monkeys. Using slices of brain-cortex suspended in suitable media he has observed a linear relationship between the uptake of potassium and the consumption of oxygen when glucose and glutamate are present in the medium. Dinitrophenol in high concentration reduces both the consumption of oxygen and the uptake of potassium. Mr. Husdan's analyses of brain slices do not support the view that brain cells are hypertonic to the environment. Miss E. A. Robertson has demonstrated that muscle-mitochondria are relatively permeable to potassium, that they contain small amounts of "bound" sodium and potassium, and that the ratio of sodium to potassium in these particulates is much higher than in whole muscle. This observation suggests that the mitochondria contain a large proportion of the small amount of sodium which exists normally in muscle cells.

Researches under the supervision of Professor C. S. Hanes have been directed mainly to the subject of enzymic group-transfer reactions, particularly reactions related to the formation of peptides. Mr. C. K. Harris, in addition to surveying the distribution of certain proteolytic enzymes in different cytological fractions, has studied methods for detecting interactions between nucleotides and amino acids. Mr. A. T. Matheson has studied further the properties of an unusual peptidase for which the claim has been made that it is non-protein in nature. Miss E. H. M. Wade has worked on the improvement and extension of a system for the quantitative analysis of complex mixtures of amino acids by paper-chromatography. Mr. K. A. Walsh has begun kinetic studies on the sucrose-phosphorylase, this enzyme having been chosen as one that catalyzes a group-transfer reaction in which the enzyme is thought to participate as an intermediary acceptor.

In collaboration with Professor A. M. Wynne, Mr. T. Bojarski has continued his studies on the distribution of certain enzymes and other constituents in several cytological fractions obtained by the differential centrifugation of homogenates prepared from normal liver and from Novikoff hepatoma. We are indebted to Professor A. W. Ham of the Department of Anatomy and to his assistant Mr. G. A. L. Ross for supplies of Novikoff tumour. Professor A. F. Howatson of the same department has collaborated with us by examining with the electron microscope some of our intracellular particulate-fractions.

Graduate students have completed the following theses:

For the Ph.D. degree:
Connell, George E. Aspects of γ-glutamyl transpeptidation reactions.

HOLMES, RICHARD. The mechanism of the biosynthesis of enzymes.
SMILLIE, LAWRENCE B. The isolation and properties of proteins associated with deoxyribonucleic acid.

PUBLICATIONS

BUTLER, G. C. "Phosphodiesterase from Snake Venom"; in *Methods in Enzymology*, ed. S. P. Colowick and N. O. Kaplan, pp. 561–5. New York: Academic Press. 1955.
BUTLER, G. C. and PACKHAM, M. A. "Reinvestigation of the Fate of Injected Glucuronic Acid, Glucurone and Naphthol Glucuronide in the Rat (*Archives of Biochemistry and Biophysics*, vol. 56, 1955, pp. 551–3).
CONNELL, G. E. and HANES, C. S. "Enzymic Formation of Pyrrolidone Carboxylic Acid from γ-Glutamyl Peptides" (*Nature*, vol. 177, 1956, pp. 377–80).
PACKHAM, M. A. "The Absorption of Labelled Glucose, Sodium Glucuronate, and Glucurone from the Gastrointestinal Tract of the Rat" (*Canadian Journal of Biochemistry and Physiology*, vol. 34, 1956, pp. 587–91).

Hygiene and Preventive Medicine

Under the direction of Professor M. H. Brown

The presentation of the subject to undergraduate medical students was altered in accordance with the recommendations of the Faculty Council. The lectures to the first medical year were omitted. The entire curriculum for the second medical year was altered. In co-operation with the Department of Medicine a series of patients suffering from chronic illnesses such as blindness, chronic heart disease, alcoholism, arthritis, etc. was presented by a member of the fourth medical year, a staff physician, and the social service worker. The social, emotional, and economic aspects of the cases were emphasized. The public health aspect of each case was discussed in the following lecture period and in this way the subject of chronic illness was built around actual patient presentation. The students were encouraged to and did participate in a free discussion of each patient.

A discussion of the preventive and public health aspects of the more common communicable diseases was presented in the latter part of the term. This presentation came after the students' work in the Department of Bacteriology and before the clinical work in the Department of Paediatrics.

The joint undertaking with the Department of Medicine as outlined above was supported in part by a grant from the Rockefeller Foundation and grateful acknowledgment is again made.

A total of 857 students was enrolled for instruction in the Department as follows: 16 candidates for the diploma in Public Health, 1 for the diploma in Dental Public Health, 2 for the diploma in Veterinary Public Health, 3 for the degree of Master of Applied Science, 2 for the certificate in Public Health, 2 for the degree of Master of Arts, 4 for the degree of Master of Science in Agriculture, 4 graduate students not proceeding to a degree, 5 graduate students registered in other departments, 151 fourth medical year students, 145 third medical year students, 125 second medical year students, 34 in the Household Economics course, 12 in the Physiology and Biochemistry course, 2 in the Food Chemistry course, 1 in the General Course, 12 in the Faculty of Household Science, 22 in the School of Physical and Health Education, 154 in the School of Nursing, 151 in the Faculty of Pharmacy, and 9 in the Dental Hygiene course.

Research

Members of the staff have undertaken the following research work:

Dr. Milton Brown and Dr. Helen Plummer studied the composition of crude Old tuberculin and its purified protein derivative (P.P.D.) by means of filter paper electrophoresis. This method indicates there are at least three components in P.P.D. and five or more in the crude Old tuberculin.

Dr. F. H. Fraser has continued the investigation of continuous electrophoresis on paper in relation to viruses.

Dr. F. O. Wishart has been associated with studies of the antibody response of various groups of children to poliomyelitis vaccine.

The amino acid utilization by *H. pertussis* grown on a chemically defined medium developed in the Department is being investigated by Dr. R. J. Wilson and Dr. M. Goldner using chromatographic techniques in an effort to clarify the nutritional requirements and metabolism of this micro-organism. These two investigators are also studying the penicillinases elaborated by penicillin-resistant staphylococci. Dr. Wilson and other members of the Department are collaborating with members of the Connaught Medical Research Laboratories in conducting a field trial on the antigenicity of currently produced poliomyelitis vaccine in infants and children.

As part of a project on chemotherapy of tuberculosis, Dr. C. O. Siebenmann investigated the antigenic properties of isoniazid-resistant strains of Mycobacterium tuberculosis.

Dr. E. Kovacs carried out research on tissue cultures infected with poliomyelitis viruses, demonstrating a marked decrease of nine different enzyme systems at the height of virus growth. This important finding provides a quantitative measure of the effect and an explanation of the mode of action of poliomyelitis virus *in vitro*.

Mr. M. D. Poulik was able to separate diphtheria and tetanus toxoids and toxins, regarded as highly purified, into several components by using starch gel electrophoresis. Using the human serum as an indicator, a test of the purity of diphtheria toxins was developed. In collaboration with Dr. O. Smithies, a two-dimensional electrophoretic separation of serum proteins was achieved.

Graduate students have completed the following theses:

For the M.A. degree:

Pawlowski, G. J. An investigation of the host-phage relationship in the mycobacteria.

For the Ph.D. degree:

Fahey, J. E. L. Studies on chronic respiratory disease of chickens and turkeys.
Lesley, S. M. Studies on virus infection with isotopically labelled coliphage.

Publications

Kovacs, E. "Comparative Biochemical Studies on Normal and on Poliomyelitis Infected Tissue Cultures: I, Observations on Synthetic Nutrient Mixtures Incubated with Tissue Cultures of Normal Kidney; II, Investigation of Various Enzyme Systems in Homogenates of Kidney Tissue Cultures of Normal Rhesus Monkeys; III, Enzyme Assays on Homogenates of Surviving Normal Rhesus Kidney—Effect of Synthetic Nutrient Mixtures" (*Canadian Journal of Biochemistry and Physiology*, vol. 34, 1956, pp. 273–87, 600–18, 619–36).

——— "Comparative Biochemical Studies on Normal and Poliomyelitis Infected Tissue Cultures: IV, Enzyme-Changes in Host Cells" (*Proceedings of the Society for Experimental Biology and Medicine*, vol. 92, 1956, pp. 183–8).

——— "Nucleases in the Cerebrospinal Fluid: IV, Dephosphorylation of Nucleic Acids by the CSF, especially of Poliomyelitis Patients" (*Journal of Pediatrics*, vol. 47, 1955, pp. 340–6).

PLUMMER, H. C. and BROWN, M. H. "An Investigation of 'A' Substance in T.A.B. Vaccine Diluted with Saline or Toxoid" (*Canadian Journal of Microbiology*, vol. 2, 1956, pp. 359–64).

POULIK, M. D. "A New Method for Rapid Quantitative Evaluation of Results of Filter Paper Electrophoresis of Serum Proteins"; abstract (*Canadian Journal of Public Health*, vol. 47, 1956, p. 45).

——— "Tests of Purity of Diphtheria Toxins by Electrophoresis in Starch Gel" (*Nature*, vol. 177, 1956, pp. 982–3).

POULIK, M. D. and PINTERIC, L. "An Electronic Computer for the Evaluation of Results of Filter Paper Electrophoresis" (*Nature*, vol. 176, 1955, pp. 1226–7).

WILSON, R. J. "How to Guard against the Menace of Tetanus" (*Health*, vol. 23, no. 5, 1955, pp. 10–11).

——— "Rabies in Canada" (*Canadian Medical Association Journal*, vol. 74, April 1, 1956, pp. 566–7).

WISHART, F. O. and MACQUARRIE, M. J. "Concentrated Tetanus Toxoid Administered Intranasally as a Recall Dose" (*Canadian Journal of Public Health*, vol. 46, 1955, pp. 334–8).

Medicine

Under the direction of Professor R. F. Farquharson

The recent death of Dr. George S. Young recalls his long period as a member of the teaching staff at the Toronto General Hospital where for many years he was Chief of the Medical Out-Patient Department. He began his professional work as a general practitioner and became one of the most sought after and most useful consultants in Medicine in Ontario. Based on a most kindly and understanding personality and on years of practical experience, from which he always continued to learn, his teaching was dominated by an interest in all that concerned the patient and by a sympathetic appreciation of the students' point of view. He took part in many activities relating to broad aspects of medical work and was President of the Royal College of Physicians and Surgeons of Canada from 1937 to 1939.

The first appointment made to the staff of the Department of Medicine from among those that were graduated after Professor Duncan Graham's revolutionary reorganization in 1919 was Dr. John Hepburn. He was appointed in 1923, two years after his graduation but seventeen years after he had begun to study medicine in Edinburgh. His sudden death on March 30, 1956, shortly after the completion of his term as President of the Royal College of Physicians and Surgeons of Canada, came as a great shock to his associates and friends. Dr. Hepburn had a clear, penetrating mind, a strong, definite personality, and a robust sense of humour. He was an excellent student and an incisive and inspiring teacher who knew intuitively how to emphasize important factors and leave out details which students would be unable to assimilate. After his retirement a few years ago he continued to act as a graduate teacher and to take an active interest in the department. He also remained a most useful member of the Faculty's Admissions Committee. He will be greatly missed.

The death of Dr. W. P. Warner, Director General of Treatment Services of the Department of Veterans Affairs, in December, 1955, was a great loss to Canadian medicine. He had been appointed to the staff of the Department of Medicine in 1929, having served and been decorated in the First World War, taken a good postgraduate training, and suffered a long illness. In the years before the Second World War he made significant contributions to the teaching of the Department and in research in the field of chest diseases. Like his close friend, John Hepburn, he was an inspiring teacher with great ability to pick out and emphasize important factors. His D.V.A. appointment prevented his return to active university work in 1945, but his interest in the care of patients and teaching of medicine led him to make a radical

reorganization of Treatment Services and to give it new aims, increased prestige, and high morale. With the one great principle in the background: that good care of the patient comes first and that the best care is likely to be given by those interested in studying medicine and teaching its principles, he conceived the idea of a close relationship between the Veterans' Services and the medical schools of the country. His success in having his plans adopted rapidly and his ability in overcoming and bypassing the usual impediments of civil service regulations allowed a sufficiently rapid expansion of the service to take care of the great rush of work in dealing with returning veterans in 1945 and 1946. The American authorities did him the honour of studying his plan and following his lead. Under his direction an excellent and enthusiastic part-time staff was built up in the D.V.A. hospitals which quickly became first-class centres for graduate training of internes and residents as well as for active clinical investigation. He worked hard, often when his health was barely equal to the task, and he never lost his interest and vision. Fortunately he lived to see the great success of his efforts and to have the satisfaction of receiving the honorary degree of Doctor of Laws from his own university in recognition of his achievement.

The resignation of Dr. Robert C. Dickson because of his appointment as Professor of Medicine at Dalhousie University is mentioned with pride and regret. It is interesting that he is the fifth man who was graduated from Toronto and trained under Professor Graham to be appointed to the Chair of Medicine in a Canadian University. After a long postgraduate training and distinguished service in the Army Medical Corps where he became Lieutenant-Colonel in charge of the Medical Service in No. 15 Canadian General Hospital, Dr. Dickson returned to join the staff of the Department of Medicine in 1945. On the sudden death of Dr. Neil MacGillivray in 1949, he was appointed Chief of the Medical Service at the Wellesley Division of the Toronto General Hospital. He organized the teaching unit there with the remarkable administrative and professional ability and the sound principles and good judgment which he had demonstrated so well in the Army. His reputation as teacher and physician grew rapidly and he became one of our foremost consultants. His departure from Toronto was a cause of great regret to all his associates. We shall, however, always regard him as one of ourselves, and our best wishes go with him and to Dalhousie University as he takes on his new duties there.

It is a pleasure to report that the physicians who had served as senior internes in Medicine at the Toronto General Hospital while Miss Clutton has been secretary of the Department expressed their great appreciation of her kindness and help to all of them over the years by giving her, in the summer of 1955, a trip to the West Coast, with the request that she visit as many of those who are settled en route as possible. It is anticipated that she will visit the East Coast at a later date.

The Department welcomes the appointment as Clinical Teachers of Dr. Robert H. Sheppard at the Toronto Western Hospital and Dr. Edmund R. Yendt at the Toronto General Hospital, and the promotion of Dr. Arthur H. Squires to succeed Dr. Dickson as Physician-in-Charge of the Medical Service at the Wellesley Division of the Toronto General Hospital.

Research

Arthritis and Collagen Diseases

Dr. Wallace Graham and Dr. Phillip Rosen have continued their studies of the shoulder-hand syndrome. At the Toronto General Hospital and the Clinical Investigation Unit of Sunnybrook Hospital, Dr. Metro Ogryzlo, with numerous collaborators and the active assistance of Professor Dauphinee and members of his department, has continued vigorous investigation of a wide range of studies in relation to rheumatic and collagen diseases and the L.E. (*lupus erythematosus*) cell phenomenon. Dr. Hugh Smythe has made a survey of cardiac lesions occurring in rheumatoid arthritis and ankylosing spondylitis.

Cardiovascular and Respiratory Disorders

A new cardiovascular research laboratory has been constructed at the Toronto General Hospital with funds given by Messrs. John McFayden and John Frame of Toronto. It was equipped largely by a National Health Grant to the Departments of Medicine and Surgery and furnished by the Toronto General Hospital, which also supplied new angiocardiography equipment. It is being supported in large part by an Ontario Heart Foundation grant to the Departments of Medicine and Surgery.

An angiocardiography unit has also been installed at St. Michael's Hospital.

Drs. Ramsay Gunton and C. R. Woolf, with the aid of Dr. W. Paul of the Department of Pathological Chemistry, have continued their investigations on the mechanism of shock following cardiac infarction, the uses of an ear oximeter in the study of congenital heart disease, and studies of haemodynamic changes and pulmonary function in pulmonary heart disease. They have begun the study of the measurement of pulmonary blood flood and pulmonary vascular resistance. Dr. C. R. Burton, who has been making a survey of electrocardiograms taken at the Toronto General Hospital in the past seven years, is studying, with Dr. Dauphinee's help, the value of measurements of glutanic oxalacetic transaminase in patients with cardiac infarction. Drs. Greenwood and McKelvey continue studies of the effect of surgical procedures on the natural course of rheumatic disease with mitral stenosis. With their surgical colleagues, they are studying new technical methods to improve diagnosis of mitral regurgitation as a complication of mitral stenosis. Dr. R. Ian Macdonald, and Drs. Morrow and Field, at Sunnybrook Hospital and the Toronto General Hospital, continue the study of the value of hypotensive drugs, and Dr. Macdonald with Drs. J. A. Little and H. M. Shanoff is continuing a prolonged study of coronary atherosclerosis. Drs. Moran and Wilson, at St. Michael's Hospital, have been studying the value of measurements of C-reactive proteins in patients with myocardial infarction and, with Dr. Hawks, the efficacy of oral administration of penicillin V in the prolonged treatment of patients with bacterial endocarditis. Drs. K. W. G. Brown, W. B. Spaulding and W. G. Grant have continued their studies of peripheral vascular disease at the Toronto General Hospital and Sunnybrook Hospital. Dr. D. P. Murnaghan continues his interest in the development of techniques for reproduction of heart sounds. Dr. Murnaghan and Dr. Rowland, at the Wellesley Division, continue their studies of cor pulmonale. Dr. Pugsley continues work on the development of his new type of respirator.

Dermatology

At St. Michael's Hospital, Dr. Hudson is studying the effect of topical administration of steroid hormones. At the Toronto General Hospital, Drs. Wrong and Verville are studying the value in secondarily infected dermatoses of topical therapy with prednisolone and neomycin in an ointment base.

Gastroenterology

Dr. J. C. Sinclair is continuing the aetiologic and diagnostic study of infectious hepatitis and serum jaundice which was begun in co-operation with Dr. C. E. van Rooyen and is being carried on in conjunction with the Department of Bacteriology. Dr. Bingham continues his work on the macrocytosis of liver disease and disorders of the liver in chronic alcoholism. Dr. Paul O'Sullivan is studying, by endoscopic examination, the relationship of the appearance of the gastric mucous membrane to its secretory function and histopathology.

Haematology

Most of the haematological studies of the Department are considered by Dr. K. J. R. Wightman in the report of the Department of Therapeutics. Dr. E. A. McCulloch, with the co-operation and advice of Dr. R. C. Parker, has been success-

ful in maintaining growth of leukaemic leukocytes in tissue culture. He has continued work on plasma phospholipid turnover in several endocrine states in collaboration with Miss Britton (Department of Pathological Chemistry). With the collaboration of Dr. Howatson (Department of Anatomy) and with the use of the electron miscroscope, a study of the fine structure of human bone marrow cells is being carried on. Dr. Dorothy Ley continues the study of anaemia caused by malignant lesions, using radioactive isotopes and other measures. She has studied with Dr. FitzGerald the cytological responses in severe allergic disorders. Dr. Bardawill's studies on the phosphatase activity of leukocytes of normal and leukaemic subjects, the cholinesterase activity of red blood cells in various malignant diseases and amino acid metabolism in malignancy are being continued.

Metabolism and Endocrinology

Drs. Ezrin, Johnston, Laidlaw, Ogryzlo and Yendt have been making extensive studies in endocrinology. Dr. Laidlaw has studied particularly adrenal cortical function in health and disease and the value of ACTH tests in the diagnosis of Cushing's syndrome. Working with him, Dr. Alan Edwards has studied the response to ACTH in late pregnancy and the puerperum. Dr. Laidlaw and Dr. Gornall (Pathological Chemistry) have investigated the possible placental origin of adrenal hormones in a pregnant woman whose adrenal glands had been removed. A study with Dr. Donald Fraser (Paediatrics) demonstrated the beneficial effect of cortisone therapy in a child with hypophosphatasia.

Drs. Johnston and Volpé continue the study of changes in thyroid function in health and disease; they have observed changes in thyroid activity in a series of fifty-four cases of subacute thyroiditis. Drs. Ogryzlo, Johnston and Volpé have followed the effect of administration of TSH in patients with anterior pituitary insufficiency, myxoedema and hyperthyroidism.

Dr. R. H. Sheppard has established a laboratory at the Toronto Western Hospital for the diagnosis and therapeutic use of I_{131} in disorders of the thyroid gland.

Dr. Ezrin and Dr. J. W. Dawson (Pathology) have made extensive studies of the cytology of the pituitary gland in various endocrine and other diseases and, with Dr. Horsey (Surgery), continue the study of the effects of experimental hypothalamic lesions in cats and monkeys on pituitary structure and function.

Using Dr. Campbell's rapid and exact methods for determination of calcium in serum and urine, Dr. Yendt is studying calcium metabolism in patients with malignant disease of bone (with Dr. Warwick), in hyperparathyroidism and after administration of vitamin D. He has also demonstrated remarkable changes in citrate metabolism in a patient with renal hyperchloraemic acidosis which could be corrected by appropriate therapy. In collaboration with Dr. Donald Fraser (Paediatrics), he has carried out *in vitro* calcification studies in cases of vitamin-D-resistant rickets.

Dr. John Finlay, working with Dr. Wightman, has been studying the malabsorption syndrome (sprue) with special reference to absorption of sugars, calcium metabolism and changes in bone.

Drs. W. E. Hall and J. A. Little (St. Michael's Hospital), W. T. W. Clarke and W. B. Spaulding (Toronto General Hospital), M. A. Ogryzlo (Sunnybrook Hospital), G. W. Smith (Wellesley Division, T.G.H.) and J. G. Watt (Toronto Western Hospital) collaborated with Professor Best in a study of the effect and value of administration of BZ-55 in treatment of diabetics and a series of articles has been published. Dr. Hall has studied the electrolyte balance in severe oliguria.

Dr. J. D. L. FitzGerald and Dr. J. R. McLean with Dr. R. D. Bell (Otolaryngology) have been studying the incidence of allergic tendencies in patients with glomerulonephritis and in a control group of nurses-in-training.

Neurology

Dr. Hyland and Dr. Forman have reviewed the cases of hemiballismus that have been found in the Toronto area in recent years, finding the prognosis not as bad as

had been generally considered. Dr. Hyland and Dr. G. W. Fitzgerald have reviewed seventy-two cases of hereditary cerebellar ataxia. Dr. J. C. Richardson, with Dr. M. Hill, is reviewing the cerebral symptoms of hypoglycaemia in cases of pancreatic islet cell tumour. Dr. A. M. Park continues his studies of metabolic changes in acute alcoholics in the withdrawal state and the efficacy of a number of newer drugs. Dr. J. W. Scott, with various collaborators, continues investigation of physiological changes in hypothermia and, with Dr. Cappon, of physiological changes during sleep and dreaming.

Miscellaneous

Dr. Owen and Dr. W. B. Spaulding have made a survey of the clinical manifestations of *E. coli* bacteriaemia. Dr. Spaulding has continued his study of cat scratch disease.

Publications

Barnett, H. J. M. "Giant-Cell Arteritis (Temporal Arteritis)" (*University of Toronto Medical Journal*, vol. 33, no. 1, Nov., 1955, pp. 15–18).

Berris, B. "Periodic Paralysis in Patient with Hyperthyroidism" (*Proceedings of the Royal College of Physicians and Surgeons of Canada*, 1954, pp. 11–12).

Burton, C. R. "Anticoagulant Therapy in Fresh Infarction of the Heart" (*Journal of the American Geriatrics Society*, vol. 3, no. 4, April, 1955, pp. 226–31).

——— "The Heart Problem in Canada" (*Health*, vol. 24, no. 2, March–April, 1956, pp. 20–1).

Clarke, W. T. W. "Clinical Experience with U-2043(Orinase)" (*Canadian Medical Association Journal*, vol. 74, no. 12, June 15, 1956, p. 998).

Finlay, J. M. "Osteoporosis" (*Canadian Medical Association Journal*, vol. 74, no. 10, May 15, 1956, pp. 823–8).

FitzGerald, J. D. L. and Irvine, A. H. "Use of Cortisone and ACTH in Serum Sickness and Penicillin Reactions" (*Canadian Medical Association Journal*, vol. 74, no. 1, Jan. 1, 1956, pp. 46–9).

Graham, D. C. "The Problem of the Rheumatic Patient in Industry" (*Bulletin of the Academy of Medicine*, Toronto, vol. 29, no. 7, April, 1956, pp. 162–8).

Graham, W. and Graham, K. M. "Our Gouty Past" (*Canadian Medical Association Journal*, vol. 73, no. 6, Sept. 15, 1955, pp. 485–93).

Gunton, R. W. "Blood Volume in Congestive Failure" (*Proceedings of the Royal College of Physicians and Surgeons of Canada*, 1954, pp. 4–5).

Hall, W. E., Little, J. A., and O'Sullivan, M. O. "Preliminary Experience with BZ-55" (*Canadian Medical Association Journal*, vol. 74, no. 12, June 15, 1956, pp. 991–2).

Heywood, P. M. and Richardson, J. C. "Sensory Neuropathy following Chickenpox" (*Canadian Medical Association Journal*, vol. 74, no. 11, June 1, 1956, pp. 903–6).

Laidlaw, J. C. "Special Uses of Corticotropin in Diagnosis and Stress" (*Academy of Medicine of New Jersey Bulletin*, vol. 1, no. 2, June 15, 1955, pp. 15–20).

Laidlaw, J. C., Dingman, J. R., Arons, W. L., Finkenstaedt, J. T., and Thorn, G. W. "Comparison of the Metabolic Effects of Cortisone and Hydro-cortisone in Man" (*Annals of the New York Academy of Sciences*, vol. 61, May 27, 1955, pp. 315–23).

Laidlaw, J. C., Reddy, W. J., Haydar, N. A., Renold, A. E., and Thorn, G. W. "Determination of Total 17-Hydroxycorticoids in Plasma" (*Journal of Clinical Endocrinology and Metabolism*, vol. 16, no. 3, March, 1956, pp. 380–90).

Laidlaw, J. C., Reddy, W. J., Jenkins, D., Haydar, N. A., Renold, A. E., and Thorn, G. W. "Advances in the Diagnosis of Altered States of Adrenocortical Function" (*New England Journal of Medicine*, vol. 253, no. 18, Nov. 3, 1955, pp. 747–53).

McCulloch, E. A., Parker, R. C., and Wightman, K. J. R. "Continuous Cultivation of Cells Derived from Hemic Cells of Man and Pure Strain Mice" (*Proceedings of the American Association for Cancer Research*, vol. 2, April, 1956, p. 132).

McKelvey, A. D. "Rheumatic Fever" (*University of Toronto Medical Journal*, vol. 33, no. 1, Nov., 1955, pp. 4–9).

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Obstetrics & Gynaecology

Under the direction of Professor D. E. Cannell

The undergraduate teaching programme has continued satisfactorily. There were no failures in the third or fourth years in 1956. This may be evidence of some improvement in student understanding of Obstetrics and Gynaecology.

Postgraduate teaching in the Advanced Refresher Course, the Alumni programme, the Kellogg Foundation Clinics, and many other fields continues unchanged.

Certain aspects of the relationship between the teaching hospitals and the University occasion concern. There is no mechanism available by which clinical research requiring patient hospitalization can be accomplished in this centre without undue cost to the patient, the hospital or the public. In view of the imminence of some form of compulsory hospital insurance the solution of this problem is urgent.

Similarly, the lack of funds for travel for those interested in research restricts progress. This is particularly true in the case of the young investigator. The federal government's action in restricting income tax deductions for travel has not improved the situation for more senior members of the staff.

The Department is pleased to announce the promotion of Dr. T. C. Jewell to the rank of Associate. Drs. J. R. Norris and J. A. Low have been appointed as Clinical Teachers in the Department and are attached to the staff of the Toronto General Hospital. Dr. J. A. Harper has been appointed as a Clinical Teacher in the Department and is attached to the staff of St. Michael's Hospital. Dr. J. O. Swales has been appointed a Fellow in the Department.

It is expected that the Women's College Hospital will become a teaching hospital of the University. Drs. Marion Hilliard, Geraldine Maloney, Sheila Hill, and Henrietta Banting will undertake the teaching of Obstetrics & Gynaecology of the third year at this hospital during the next session. As the hospital becomes organized, teaching in the fourth year will be provided too.

Drs. G. A. Cram, P. J. Farrell, and J. F. Moffat are establishing themselves in practice in Port Arthur, Sudbury, and Toronto respectively. The best wishes of the Department go with them in their new activities.

The Department was honoured by visits from Dr. H. B. Atlee, Professor of Obstetrics and Gynaecology, Dalhousie University, Halifax, Nova Scotia; Dr. R. Caldeyro-Barcia, Professor of Obstetrical Physiology, Montevideo, Uruguay; Dr. M. Edward Davis, Professor of Obstetrics and Gynaecology, University of Chicago, Chicago, Illinois; Dr. Mario Gomez from the University of Chile, Santiago, Chile, who spent ten months in the Department as a Visiting Fellow with general interest in Obstetrics and Gynaecology; Dr. A. T. Hertig, Professor of Pathology, Harvard University, Boston, Massachusetts; Drs. K. D. Kolluri and K. Kalawar, two Indian obstetricians and gynaecologists from Hyderabad and Bombay respectively, who spent several weeks here supported by the Colombo Plan; Dr. Duncan E. Reid, Professor of Obstetrics, Harvard University, Boston, Massachusetts; Dr. C. S. Stevenson, Professor of Obstetrics and Gynaecology, Wayne University, Detroit, Michigan; and Mr. Stanley A. Way, Associate Surgeon and Gynaecologist, Royal Victoria Infirmary, Newcastle, England.

During the course of the year members of the Department took part in many scientific meetings. They were well represented in national and international obstetrical and gynaecological societies.

In May of this year a sectional meeting of the American College of Obstetrics and Gynaecology was held in Toronto. The success of this meeting was in large part due to the work of the committees under the chairmanship of Dr. D. N. Henderson.

The Head of the Department wishes to express his gratitude to his colleagues in the Department, Faculty, and University for their co-operation and assistance during the past year.

Research

Members of the staff have undertaken the following research work:

Dr. W. H. Allemang has completed his study on the effects of various analgesic drugs in labour. The results of this study will be available this fall. He and Dr. K. Hodge of the Department of Radiology have continued their studies of the radiographic localization of the placenta. They have extended them in gynaecologic conditions where clinical diagnosis was uncertain or difficult.

Dr. L. T. Armstrong and staff have co-operated with the Departments of Medicine and Surgery at the Toronto Western Hospital under the direction of Dr. Dorothy Ley in a study of the effect of ACTH and nitrogen mustard upon metastatic malignant disease. The preliminary results of this study were reported at the meeting of the American College of Obstetrics and Gynaecology held in Toronto, May 12, 1956.

Dr. J. D. M. Gillies and Dr. D. J. Van Wyck presented the results of their studies in Rh sensitization to the Society of Obstetricians and Gynaecologists of Canada at their 1956 June meeting. This study will be continued for at least one more year to determine, if possible, the effect of difficult labour and other complications of delivery upon the incidence of iso-immunization of Rh negative mothers.

Dr. R. A. H. Kinch reported the results of his study of fibrinogen levels in pregnancy and their significance at the 1955 meeting of the Society of Obstetricians and Gynaecologists of Canada. He is continuing and extending his studies in this field and recently reported upon the value of fibrinodex in the diagnosis of hypofibrinogenaemia at the 1956 meeting of the same society.

Dr. J. A. Low has initiated an investigation of the oxygen saturation of the foetus at delivery. He is attempting by the collection of all relevant obstetrical data to determine, if possible, the relationship of anoxia to the development of subsequent cerebral palsy. This is a long-term project which in its first year was supported by the Rotary Club of Toronto and in the coming year will be supported by the Ontario Society for Crippled Children. He is also investigating urinary stress incontinence in the female. A comprehensive clinical, cystometric and radiographic investigation is being carried out upon selected patients suffering from this distressing condition.

Dr. J. R. Norris has continued his studies on perinatal mortality. A complete review of the findings in this three-year period is in the process of preparation.

Dr. W. M. Paul, Dominion Stores Fellow, completed his study of foetal haemoglobin by the production of precipitin. He is continuing his study of bradycardia and oxygen saturation of the sheep foetus *in utero*. This will be extended to include the effect of hypotensive anaesthesia and hypothermia upon the oxygen content of the foetus in other experimental animals. The results of other investigations which Dr. Paul has completed in association with Dr. S. R. M. Reynolds and others have been reported in the list of publications previously noted.

The problem of pregnant diabetics and their offspring continues to absorb the attention of Dr. J. W. Rogers and Dr. R. A. H. Kinch of our Department and Dr. W. T. W. Clarke of the Department of Medicine. Some progress has been made in improving foetal salvage and certain interesting findings in regard to the sex of the infants who have been lost are being subjected to further scrutiny.

Dr. C. B. Shier has continued his studies in an effort to determine whether cytologic smears and/or biopsies are of value in the prognosis of outcome in patients with carcinoma of the cervix treated by radiotherapy. To date, 181 patients with stage 1 and 2 lesions have been followed for five years. It is felt that at least 250 such patients will require study before any significant conclusions may be arrived at.

Seventy-five patients with carcinoma *in situ* of the cervix have been followed for four years. At present there seems to be no indication that our conservative approach to the management of this condition in the younger age groups should be altered.

A graduate student, Dr. D. Kumar, in association with Dr. A. G. Gornall and Dr. W. Anderson of the Departments of Pathological Chemistry and Pathology respectively, has continued his studies upon aldosterone. He has reported to the Endocrine Society the results of his studies on the pathological effects of prolonged treatment of experimental animals with this substance. Efforts to increase further our knowledge of the relationship of this substance to toxaemia of pregnancy in the human have been held up by the absence of suitable patients for clinical investigation.

Publications

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Ophthalmology

Under the direction of Professor A. J. Elliot

During the past academic session the Department has completed its tenth year of the enlarged postgraduate training programme initiated by Professor W. W. Wright during the war. During these ten years 46 physicians have been trained in ophthalmology, all of whom are practising in cities across Canada. It is gratifying to note the increasing sphere of usefulness of the training programme in ophthalmology for physicians in this country. During the past year there were fourteen postgraduate students in the Department. Dr. D. W. Harper, Stoney Creek, Ontario; Dr. R. D. Lawton, Halifax, N.S.; and Dr. M. Neveu, Trois Rivières, Quebec, were appointed Hermant Fellows and Dr. S. H. Witzel, Newcastle, Ontario, was appointed a Fellow to work under a National Health Grant for the study of keratitis and endophthalmitis. Major J. A. Beswick, R.C.A.M.C., was appointed to the three-year course and spent the first year in the study of the basic sciences relating to ophthalmology and research work in glaucoma at the Toronto Western Hospital. Five students completed their postgraduate studies: Major J. T. Baird, R.C.A.M.C.; Dr. R. L. Hall, Saskatoon, Sask.; Dr. H. R. Hausler, Toronto; Dr. E. I. Querengesser, Kitchener, Ontario; and Dr. M. Shea, Galway, Ireland. Dr. Hausler was awarded a McLaughlin Travelling Fellowship to study the ocular effects of diabetes in Europe and Dr. Shea has been appointed a Fellow of the Retina Foundation of the Massachusetts Eye and Ear Infirmary, Boston.

There was a general revision in the teaching of ophthalmology to the students in the third medical year. The number of lectures was materially reduced and the available time devoted to bedside clinics in ophthalmoscopy. This change in the teaching seems to have met with considerable success and it is planned to continue the same programme for the third medical year in the next academic session. Mr. H. M. Taylor was awarded the J. F. Hartz Company prize for obtaining the highest mark in ophthalmology in the third year.

Dr. R. G. C. Kelly gave lectures on eye injuries to the Medical Joint Training Centre of the Armed Forces. He was President this year of the Central Ontario Branch of the Defence Medical Association of Canada and continued as Secretary of the Canadian Ophthalmological Society. Dr. H. L. Ormsby lectured at the meeting convened by the provincial Minister of Health for public health officers on

ophthalmia neonatorum and the adenoidal-pharyngeal-conjunctival (APC) virus syndrome. He contributed to a symposium on ophthalmia neonatorum at a special meeting of the National Society for the Prevention of Blindness in Chicago and spoke to the New England Ophthalmological Society in Boston in November. He was guest speaker at the University of Michigan, Ann Arbor, in April. Dr. W. R. F. Luke lectured to the Ottawa Ophthalmological Society in February. The Association for Research in Ophthalmology held a meeting in Toronto for the first time in January and members of the Department contributed eight papers to the programme. Members of the department also presented papers at the American Academy of Ophthalmology and Otolaryngology in Chicago, the Canadian Ophthalmological Society in Quebec City, and the Section of Ophthalmology of the Academy of Medicine, Toronto.

The Department of Ophthalmology held a three-day refresher course in eye surgery in March, 1956, with a registration of 37 physicians from across Canada and the northern United States. The guest surgeons were Dr. Conrad Berens, New York, N.Y., Dr. Philip M. Lewis, Memphis, Tenn., and Dr. Harold G. Scheie, Philadelphia, Pa.

For reasons of health, Dr. T. H. Hodgson is retiring from the Toronto General Hospital active staff after eighteen years' service. He will, however, continue his direction of the glaucoma research programme.

Dr. Lois A. Lloyd is joining the staff of the Department after a year spent in England and Europe studying neuro-ophthalmology on a McLaughlin Fellowship, to which fellowship she was the first woman to be appointed. She has been awarded a J. P. Bickell Foundation grant for medical research on diseases of the optic nerve and will start a neuro-ophthalmological clinic at the Toronto General Hospital and at the Hospital for Sick Children, Toronto.

Research

Members of the staff have undertaken the following research work:

The federal health grant for "Prevention of Blindness from Glaucoma" was continued under the direction of Dr. T. H. Hodgson. Dr. R. K. MacDonald has continued his studies on electronic tonography with special reference to the problems of low tension and congestive glaucoma. Miss S. J. Hennighausen has investigated the effect of Diamox on the ascorbic acid concentration in aqueous humour and jointly with Dr. Hodgson presented reports on this work to the Association for Research in Ophthalmology in January and the Canadian Ophthalmological Society in June.

The federal health grants for "Ocular Diseases of Virus Aetiology" and the "Study of Keratitis and Endophthalmitis" were also continued under the direction of Dr. H. L. Ormsby. Mrs. A. Fowle and Mrs. V. Simmons continued their studies on the APC viruses isolated from patients with keratoconjunctivitis. Miss F. Doane, in co-operation with Dr. A. J. Rhodes at the Hospital for Sick Children, isolated a number of strains of virus from patients with conjunctivitis during an epidemic of pharyngo-conjunctival fever which occurred during the summer of 1955. Typing of these strains has shown them to belong to the APC group of viruses. Dr. D. W. Harper and Miss A. Cockeram have made a study of toxoplasmic skin reactions in the Toronto area. Three hundred patients in all age groups have been tested and their sera sent to Dr. Labzoffsky at the Provincial Health Laboratories for complement fixation antibody estimations. Dr. S. H. Witzel and Mrs. I. Fielding have surveyed the commonly used antibiotics for ocular penetration by local systemic routes of administration and by iontophoresis.

Under a federal health grant for "Eye Bank and Corneal Transplantation" Dr. P. K. Basu is studying the effect of storage on corneae relative to their subsequent clarity following grafting. Miss Cockeram and Miss I. Miller are studying the viability of cornea in tissue cultures following various methods of storage. Mrs. Fielding

is studying the effect of storage on corneal proteins by electrophoresis. In co-operation with the Canadian National Institute for the Blind, Mrs. R. MacKneson has organized an eye bank for the procurement of eyes suitable for transplantation and the distribution of such eyes to surgeons who wish to perform corneal transplantation operations.

At the Toronto General Hospital research on the use of P32 as a diagnostic aid in cases of intraocular neoplasms was continued by Dr. G. A. Thompson. Ten cases were studied and it was felt that the results warranted further application of this procedure. Treatment of various ocular lesions with radiotherapy was carried out in conjunction with the staff of the Radiotherapy Department. The lesions treated included vernal catarrh, pterygia, neovascularization of the cornea, epithelial downgrowth of the anterior chamber and various malignancies of the lids, globe and orbit.

At the Hospital for Sick Children, research has continued on the causes of congenital glaucoma, under the direction of Dr. A. L. Morgan. Dr. J. S. Crawford, assisted by Dr. J. A. Beswick, is carrying on a clinical research study of methods of treatment of exotropia. Dr. W. P. Callahan has continued research on the use of colour slit-lamp photography in conjunction with the Photographic Department of St. Michael's Hospital. At the Toronto Western Hospital, under the direction of Dr. Clement McCulloch, research has continued on the use of tonography in the diagnosis of glaucoma and on the transfer of substances through the cornea. An anatomic study was undertaken on the Canal of Schlemm.

Publications

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Doane, Frances, Rhodes, A. J., and Ormsby, H. L. "Rapid Diagnosis of Herpetic Infections by Isolation of Virus in Tissue Cultures" (*Canadian Medical Association Journal*, vol. 73, no. 4, Aug., 1955, pp. 260–3).

——— "Tissue Culture Techniques: In the Study of Herpetic Infections of the Eye" (*American Journal of Ophthalmology*, vol. 40, no. 5, Part II, Nov., 1955, pp. 189–93).

Fowle, A. M., Cockeram, Anne, and Ormsby, H. L. "Virus Isolations from Patients with Keratoconjunctivitis" (*American Journal of Ophthalmology*, vol. 40, no. 5, Part II, Nov., 1955, pp. 180–8).

Hiltz, J. W. "The Use of Catgut Sutures in Cataract Surgery" (*Bulletin of the Academy of Medicine*, Toronto, vol. 29, no. 6, March, 1956, pp. 138–42).

Hodgson, T. H. "Clinical Aspects of Glaucoma"; in *Glaucoma, a Symposium*, ed. W. S. Duke-Elder, pp. 273–92. Oxford: Blackwell. 1955.

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Kelly, R. G. C. and Hall, R. L. "A Survey of Visual Problems Relating to Motor Accidents" (*Canadian Services Medical Journal*, vol. 12, no. 3, March, 1956, pp. 209–14).

Macrae, H. M. and Cowan, R. F. "Clinical Follow-up Study of Retinal Detachment Surgery" (*Transactions of the Canadian Ophthalmological Society*, vol. 7, 1954–5, pp. 269–80).

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McCulloch, Clement, Macdonald, D'Arcy, MacDonald, R. K., Sniderman, H., and Teichmann, B. "Symposium on Clinical Assessment of Glaucoma with particular reference to Diurnal Variations in Intraocular Pressure" (*Transactions of the Canadian Ophthalmological Society*, vol. 7, 1954–5, pp. 171–200).

Morgan, A. L. and Arstikaitis, M. "Survey of 1,000 Post-operative Strabismus Cases"

(*Transactions of the Canadian Ophthalmological Society*, vol. 7, 1954–5, pp. 46–52).

Ormsby, H. L. "The APC Viruses" (*Modern Medicine of Canada*, vol. 2, no. 5, May, 1956, pp. 127–38).

——— "An Interim Report on Ocular Diseases due to APC Viruses in Ontario" (*Canadian Journal of Public Health*, vol. 46, no. 12, Dec., 1955, pp. 500–5).

——— "Results of the Survey of Eye Virus Diseases in Canada" (*Transactions of the Canadian Ophthalmological Society*, vol. 7, 1954–5, pp. 324–34).

Ormsby, H. L. and Aitchison, W. S. "The Role of the Swimming Pool in the Transmission of Pharyngeal-Conjunctival Fever" (*Canadian Medical Association Journal*, vol. 73, no. 11, Dec., 1955, pp. 864–6).

——— "Sight-saving Classes" (*Canadian Journal of Public Health*, vol. 46, no. 5, May, 1955, pp. 191–3).

Ormsby, H. L., Fowle, Ann M. C., and Cockeram, Anne. "Relationship of Epidemic Keratoconjunctivitis to the Adenoidal-Pharyngeal-Conjunctival (APC) Virus Syndrome" (*Canadian Medical Association Journal*, vol. 73, no. 9, Nov., 1955, pp. 710–13).

Schirmer, K. E. and Ormsby, H. L. "Experimental Studies with Acetazoleamide in Anaphylactic Iridocyclitis in Rabbits" (*American Journal of Ophthalmology*, vol. 41, no. 4, April, 1956, pp. 667–71).

Speakman, J. S. and Ormsby, H. L. "Studies of Immunity in Vaccinia Keratitis in Rabbits" (*American Journal of Ophthalmology*, vol. 40, no. 5, Part II, Nov., 1955, pp. 194–200).

Thompson, G. A. "Radiotherapy in Ophthalmology" (*Bulletin of the Academy of Medicine*, Toronto, vol. 29, no. 3, Dec., 1955, pp. 60–8).

Oto-Laryngology

Under the direction of Professor P. E. Ireland

This year has seen additional responsibility placed on our younger staff members with the retirement of many of our well-known senior staff men during the past two or three years. The wisdom of choosing well-trained junior men is beginning to bear fruit. This was especially shown during the past winter when two of our remaining senior staff men were ill for several months. Unfortunately, Dr. H. W. D. McCart is still unable to return to duty at the present time.

Mr. J. W. Dixon, F.R.C.S., from Oxford, England, has completed a year of exchange with Dr. W. S. Goodman. This year has been profitable to both men. Dr. Goodman will be joining the staff of the Department of Otolaryngology as a full-time Fellow beginning July 1, 1956. In addition to his stay in Oxford, he had an opportunity of visiting various European centres.

The Canadian Otolaryngological Society held its annual meeting in Quebec City; Dr. P. E. Ireland and Dr. G. A. Henry are on the Council of this Society. Dr. J. B. Whaley and Dr. D. P. Bell presented papers at this meeting.

The senior American societies met in Canada this year with meetings in Montreal and at the Seigniory Club. Dr. Ireland and Dr. T. Molony presented a paper to the American Laryngological Society and Dr. D. E. S. Wishart and Dr. Page Statten gave a paper to the American Otological Society. Dr. Wishart had the honour of being guest speaker at the Eye, Ear, Nose and Throat Society convention in Memphis, Tennessee, in February. Dr. Ireland and Dr. B. W. Fearon were appointed Canadian representatives to the fifth Pan-American Congress of Broncho-Esophagology in Puerto Rico in April. Dr. Fearon presented a paper at this meeting.

The American Laryngological, Rhinological and Otological Society this year elected Dr. P. E. Ireland as President at their annual meeting. Dr. J. A. Sullivan, formerly of this Department and now on the Board of Governors of the University of Toronto, was elected Vice-President in charge of the Eastern Section. The meeting of this Section will be in Toronto next January.

Dr. D. P. Bryce was elected Chairman and Dr. H. O. Barber elected Secretary

of the Section of Otolaryngology of the Toronto Academy of Medicine for the coming year.

Research

Members of the staff have undertaken the following research work:

Dr. H. O. Barber, in association with Dr. P. E. Ireland, has made an analysis of cases of deafness due to industrial noise in a major oil refinery. He has continued his clinical study of patients with vertigo treated at the Toronto General Hospital.

Dr. J. K. B. Smith has commenced a study of temporal bone celloidin sections with Miss M. E. Gray, with co-operation from the Mosher Laboratory of the Massachusetts Eye and Ear Infirmary, Boston. With Dr. S. Bensley of the Department of Anatomy and Dr. Walter Johnson of the Defence Research Medical Laboratories, he is making a study of temporal bone sections to produce a model of the temporal bone in plastic. At the Defence Research Medical Laboratories with Dr. Johnson, and at St. Michael's Hospital, Dr. Smith is doing a clinical study of vestibular and hearing problems. This includes a study of utricular function with animal dissections and work on cerebral vascular changes in monkeys under vestibular stress. This is being done with the use of plastic cranial windows.

Dr. D. P. Bryce is continuing his study of nerve deafness at the Toronto General Hospital and Sunnybrook Hospital, under a grant from Parke, Davis and Company.

Dr. G. A. Fee is doing research on the evaluation of hearing aids in the various types of auditory tract lesions.

Dr. Page Statten is continuing his research on the psycho-galvanic skin reaction audiometer testing of infants and this year made a report on this work to the American Otological Society at its annual meeting in May.

Dr. Molony is working on virus diseases in oto-laryngology and presented a paper on this subject with Dr. Ireland at the annual meeting of the American Laryngological Society in May, 1956.

The staff of the Department of Oto-Laryngology at the Hospital for Sick Children, under Dr. J. B. Whaley, are investigating the hearing of children with cleft-palate defects. This is in conjunction with the research on cleft palate which is being carried on at this hospital.

Publications

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——— "Diagnostic Endoscopic Procedures" (*Transactions of the Canadian Otolaryngological Society*, 1955, pp. 41–53).

Ireland, P. E. and Hodges, W. E. "The Problem of Acoustic Trauma" (*Canadian Medical Association Journal*, vol. 73, no. 9, Nov., 1955, pp. 713–16).

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Steele, F. H. "External Otitis" (*Bulletin of the Toronto East Medical Association*, vol. 20, no. 11, Jan., 1956).

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Wishart, D. E. S. and Wallace, W. B. "Sinusitis in Children" (*Transactions of the Canadian Otolaryngological Society*, 1955, pp. 100–111).

Wishart, D. E. S., Whaley, J. B., and Wallace, W. B. "Rhinology in Children: Résumé of the Literature for 1954" (*Laryngoscope*, vol. 65, no. 9, Sept., 1955, pp. 736–85).

Paediatrics

Under the direction of Professor A. L. Chute

The benefits of clinical teaching, in addition to the lectures in the third year, were again clearly evident in the work of the fourth year students. It is hoped that the institution of an examination at the end of the third year (held for the first time in May, 1956) will have induced the student to consolidate his knowledge of this subject and prepare him so that he may obtain the greatest benefit from his clinical work in the final year.

It is also hoped that, in future, final year students will avail themselves fully of the wealth of clinical material on the wards, in addition to attending the more formal teaching clinics.

The Department was honoured in the presentation of "The Shovel" by the final year students in recognition of its teaching programme.

The rotation of internes from the Toronto General Hospital, St. Michael's Hospital, and the Toronto Western Hospital through the paediatric service has proved popular with the housemen from these Institutions. It has been a source of satisfaction that these men and women have given excellent service and we trust will be better equipped by their experience to enter practice.

The Department has continued to aid in the advancement of paediatric knowledge outside the Hospital and University by sending its members to take part in a wide variety of medical and scientific meetings, a few of which are noted. Professor A. L. Chute gave a number of lectures at the International Medical Assembly of Southwest Texas. Dr. J. H. Ebbs was a guest speaker at the Annual Meeting of The British Paediatric Society. Dr. Donald Fraser spoke to a gathering at Laval University. The Department has also shared in the Kellogg Programme. Professor A. L. Chute was appointed Chairman of the Clinical Investigation Travel Club of Canada.

It was a pleasure to welcome Dr. Robert Slater to the staff after an absence of four years for study at the Rockefeller Institute, New York. In addition to a wide knowledge of protein metabolism, Dr. Slater has mastered the techniques in the application of radioactive isotopes to clinical research.

It is with deep regret that we part with Dr. A. J. Rhodes, as Director of the Research Institute of the Hospital. The School of Hygiene of the University is, indeed, fortunate to have obtained so outstanding a person to head their School.

We also regret the loss of Dr. Alice Goodfellow who, over a period of years, had done such excellent work in the study of morbidity and mortality among the premature and newborn infants. Her interest and knowledge will undoubtedly continue to benefit young Canadians in her chosen field of practice.

The Research Institute has continued its studies over a wide range of subjects. Excerpts from the reports of those on the paediatric staff are briefly reported.

Research

Members of the staff have undertaken the following research work:

As in previous years, the research work of members of the staff of the Department of Paediatrics has been carried out under the auspices of the Research Institute of the Hospital for Sick Children, especially in the newly organized Metabolic Ward, and in the Biochemical Research Laboratories.

Dr. C. Collins-Williams and Mr. C. A. Best have just brought to a conclusion a two-year study of airborne pollen granules and mould spores in Toronto atmosphere;

samplings were made daily. This study will have considerable value in the therapy of patients with allergic conditions.

Dr. Gladys Boyd has continued her study of tuberculosis in collaboration with Dr. T. E. Roy. Some 717 specimens from suspect cases of tuberculosis were examined for tubercle bacilli. Only 43 (6 per cent) were positive. The sensitivities of each strain isolated were determined for streptomycin, para-aminosalicylic acid, and isonicotinic acid hydrazide.

Dr. S. H. Jackson, Chief Biochemist, has played a very important role in coordinating the work of the various research physicians making use of the Biochemical Research Laboratories. He has frequently advised in regard to the biochemical techniques to be followed by the various workers, and has himself made significant contributions.

Dr. A. L. Chute and Dr. J. D. Bailey investigated metabolic changes in 20 cases of salicylate intoxication. A considerable variation in blood levels of salicylate was found in these cases. Studies have also been done on the blood levels following absorption of salicylate from the rectum.

Dr. Chute and Dr. C. P. Rance have continued their study of the increased urinary glycocyamine excretion in children with nephrosis. Because of the suggestion that this abnormality is due to a transmethylation defect in the liver, they have given children large doses of methionine in an attempt to overcome this defect, but the results have been equivocal.

Thirty children with nephrosis have been treated with intermittent cortisone for many months in an effort to prolong hormone-induced remissions of the disease. This form of continuing therapy seems to give a considerable degree of control over the disease. Some of the more recent cortisone derivatives are now being used in the treatment of nephrotic children, with good results.

Dr. Jackson has continued his studies on the relation between calcium retention and fluoride retention in rats. In previous experiments it was the practice to pool all similar rat carcasses and analyse a single representative sample of the pooled group, thus obtaining a mean value directly. Each rat carcass is now analysed separately. This has resulted in about ten times as many estimations, but statistical methods can now be applied as tests of validity. The extra work has been lightened somewhat by the adoption of a colorimetric procedure for the estimation of fluoride, faster and more accurate than the titrimetric procedure.

In addition, Dr. Jackson has investigated autopsy material from several interesting cases. In particular, extensive analyses were carried out on fat specimens from a case of fat necrosis, and on corresponding normal controls. A high ratio of cholesterol to total fat, and of free fatty acids to total fat was found in the necrotic fat. The iodine number was normal. Further progress was made in the introduction of micro methods during the year. It is now possible to determine sodium, potassium and chloride on a total of 0.08 ml. of serum. A different micro method for calcium has been investigated. It is technically a simpler, faster method, and requires only one-fifth of the material needed for the micro flame photometer method introduced last year. Inorganic phosphorus can also be estimated by a micro method. Both calcium and phosphorus determinations can thus be done on a total of 0.07 ml. of serum.

Dr. A. Sass-Kortsak continued studies in three main problems:

(*a*) With Dr. N. T. Jaco, utilizing the facilities of the Metabolic Ward, the nature of the fat absorption defect was studied in the different forms of steatorrhea. Fat balance studies were conducted in these patients to determine their absorptive capacity for saturated and unsaturated fats separately. Such studies were performed while the patients were maintained on a predominantly saturated or unsaturated fat intake. Furthermore, the problem of fat excretion was investigated by obtaining similar observations while the patient was kept on a virtually fat-free diet. With these methods, observations were made and compared in patients suffering from idiopathic coeliac disease, fibrocystic disease of the pancreas, regional ileitis, and a

patient with a short circuit anastomosis of the small bowel.

(*b*) The study of the aetiological factors leading to the development of obstructive jaundice in early infancy was continued. Particular attention was paid to differential diagnosis. In the course of this study, clinical and biochemical findings are being closely correlated with pathological observations made by Dr. D. H. Bowden of the Department of Pathology on both biopsy and autopsy material. Particular attention was paid recently to the behaviour of serum lipids in these cases. In collaboration with Dr. O. Sirek, sequential changes of serum total lipids, neutral fat, phospholipids, free and esterified cholesterol were determined in these cases. Marked alterations were found, especially in cases of intrahepatic biliary atresia.

Efforts were made to standardize methods for the investigation of the lipoprotein distribution, in order to analyse further the nature of the hyperlipaemia. For the separation of the lipoprotein entities the method of ultracentrifugal flotation at four different solvent densities is being employed, in combination with zone electrophoresis in starch supporting medium. The fractions thus obtained are subjected to lipid and protein analysis. Observations so far indicate that the lipoprotein pattern in intrahepatic biliary atresia of infants is strikingly similar to that described in primary biliary atresia of middle-aged women.

(*c*) Attempts were also made to improve the management of infants and children suffering from portal hypertension. Transcutaneous splenic portal venography was adopted and carried out in co-operation with Dr. J. D. Munn of the X-Ray Department and Dr. Code Smith of the Department of Anaesthesia. Successful venographies were performed in 12 patients. A clear-cut differentiation between primary and secondary portal hypertension could be made. Clear delineation of the extra- and intrahepatic portal venous system with the direction and extent of abnormal anastomotic venous channels was of great help in the choice of proper operative approach.

Dr. Donald Fraser has devoted the past year to the study of metabolic disturbances which result in abnormal skeletal calcification in childhood. Studies which have been carried out in association with Dr. J. C. Laidlaw of the Department of Medicine have led to the successful use of cortisone in the therapy of a patient with hypophosphatasia, a rare condition for which there had been no satisfactory treatment heretofore. The mode of action of cortisone in producing rapid deposition of bone salts in this disease is being investigated.

A search for improvements in the therapy of the not uncommon condition vitamin-D-resistant rickets has been carried out. These studies have led to the finding that rapid healing of rachitic lesions can be brought about in such children without increasing vitamin D intake by the establishment of physiological levels of serum phosphorus. To date this has been attained by the intravenous injection of sodium phosphate. More practical means of attaining this end are being sought at the present time.

Dr. R. J. Slater has initiated a programme of investigation into certain aspects of the pathogenesis of renal disease, with special emphasis on aberrations in nutrition and protein metabolism. To provide an indication of renal function, a variety of clearance techniques were standardized (urea, inulin, creatinine, and p-amino hippurate). Since the losses of body protein as proteinuria appear to play a significant role in the metabolic changes associated with kidney disease, studies have been specifically directed to the handling of plasma proteins by the kidneys. The sequential changes in the renal clearance of albumin and gamma globulin have been assessed by quantitative immuno-chemical techniques. Preliminary results indicate that a considerable variation exists in the manner by which the kidneys filter plasma proteins in different types of renal dysfunction. Furthermore, biophysical identification of the protein constituents of the urine has provided another tool to evaluate the effects of renal disease. Integration of the clinical status of the patient with the sequential alterations in renal clearance of proteins may provide more satisfactory diagnosis and prognosis.

A survey of the problem of hypertension in children has been started in collaboration with Dr. Allan Gornall and Dr. John Morrow of the Departments of Pathological Chemistry and Medicine in the University of Toronto. The relationships which exist between aldosterone excretion, salt metabolism and the use of hypotensive drugs in juvenile hypertension are being scrutinized in careful balance studies in the metabolic unit. Preliminary findings reveal that elevated aldosterone excretion may be found as an associated biochemical alteration in the hypertensive state although no other stigma of primary aldosteronism may be present.

Dr. Elizabeth Chant-Robertson has continued her study on the effect of diet and other treatment on weight loss in children following appendectomy.

Dr. J. D. Keith, Dr. R. D. Rowe, Dr. Shiela Mitchell, Dr. R. J. Fowler and Dr. G. H. Watson have studied the use of selective angiograms as a diagnostic procedure with the object of assisting the surgeon to plan successful operative techniques. This method has proved safe and particularly effective in investigating the Tetralogy of Fallot, transposition of the great vessels, tricuspid atresia, pulmonary atresia and other defects.

In progress are a follow-up study to evaluate the effects of ACTH, cortisone and salicylates in the treatment of acute rheumatic fever, and a study to evaluate the effects of sulfonamides and penicillin in preventing rheumatic fever recurrences.

Dr. Rowe, with assistance from Dr. Stanley James, has conducted a study of the cardiovascular system of mongols, by cardiac catheterization and angiocardiograms. He has been especially interested in the post-natal closure of the ductus arteriosus, and of the foramen ovale, as well as the interarterial pressure of the pulmonary artery following birth. Pressure levels in the pulmonary artery have been studied in relation to varying concentrations of oxygen in the breathed air, and the circulatory dynamics of the newborn are being clarified.

The Metabolic Ward now functions as a self-contained service under the general direction of Dr. A. L. Chute and Dr. A. Sass-Kortsak. The principal problems studied, mainly by the "balance" technique, were as follows: steatorrhoea; pituitary dwarfism; calcium and phosphorus metabolism; renal disease; babies of diabetic mothers.

Dr. C. E. Snelling and Dr. Alice Goodfellow continued, for the third year, their study of neonatal mortality and morbidity. The causes of neonatal death were investigated in six obstetrical units in Toronto hospitals. Autopsy confirmation was obtained in over 80 per cent of the cases. Close collaboration was maintained with the University departments of Obstetrics and Gynaecology and of Pathology. Very valuable data have been accumulated, and this study has done much to focus attention on the problem of sickness and mortality in newborn infants. This interest has been aroused, not only in Toronto, but more widely in the Province, and has been stimulated by regular joint meetings of the staffs concerned and a number of lecture-demonstrations given throughout the Province, with the co-operation of the Department of Health for Ontario.

Dr. J. M. M. Darte, a full-time Fellow of the Ontario Cancer Treatment and Research Foundation, has continued his study of the treatment of cancer in children with a view to prolonging the life of these individuals, and obtaining more complete cures. Dr. Darte has had the complete co-operation of the medical and surgical staff. In many of these cases there is leukaemia, and special biochemical studies of the urinary products of these patients have been made in collaboration with Dr. S. H. Jackson and Mr. T. Sandor. Dr. Darte has obtained leave of absence from this hospital and is at the present time in Manchester, England, studying radiotherapy with particular reference to the treatment of children.

Several important projects in neurology have been conducted during the year. It is particularly satisfactory to report the organization of a team to study neuromuscular disorders, especially muscular dystrophy. Under the direction of Dr. W. A. Hawke, Dr. E. G. Murphy acts as Research Fellow and studies all cases clinically. Miss Faris of the Physiotherapy Department assesses muscle power, and Dr. J. V.

Basmajian conducts an electromyographic examination. Dr. D. H. Bowden has made a special study of biopsy material from these cases. Genetic aspects of muscular dystrophy are studied by Dr. Norma Ford Walker and Dr. Hubert Soltan. Important progress is being made in this difficult field, and an excellent example of team work is afforded.

A very complete study of children suffering from convulsive disorders has been made during the year by Dr. J. Stobo Prichard and Dr. Douglas McGreal. No less than 500 children with convulsions have now been seen in the Emergency and Admitting departments. A detailed report has been made of the aetiological factors, the family and personal history, and the clinical findings. Most of the patients have been seen subsequently, and this aspect of the study will be continued.

Dr. A. J. Rhodes has had the opportunity to undertake a collaborative study on the prophylactic efficacy of Salk type poliomyelitis vaccine. The closest collaboration has been maintained with officials of the Department of Health for Ontario. Since there was very little poliomyelitis in Ontario in 1955, evaluation of the vaccine was rendered difficult. An interesting finding was that many patients given a clinical diagnosis of non-paralytic poliomyelitis were found to be infected with the newly described group of "Echo" viruses.

During the year, earlier studies on Coxsackie virus were completed, and particular attention was paid to the features of meningitis caused by Coxsackie Group B virus. One of the most complete series of cases on record has now been reported.

Publications

Beale, A. J.; Fujiwara, M. W.; Stackiw, W.; Davis, Norma and Rhodes, A. J. "Value of Newer Tissue Culture Methods in Epidemiological Inquiries: An Illustrative Outbreak of Poliomyelitis" (*Canadian Medical Association Journal*, vol. 74, March 1, 1956, pp. 337–42).

Chute, A. L. "Adrenal Insufficiency in Children" (*Postgraduate Medicine*, vol. 18, no. 5, Nov., 1955, pp. 401–8).

——— "Problems in the Management of Juvenile Diabetes" (*Manitoba Medical Review*, vol. 35, no. 7, Aug.–Sept., 1955, pp. 416–19).

Chute, A. L. and Bain, H. W. "Experiences with Oral Sulfonamide (BZ-55) in the Management of Juvenile Diabetes" (*Canadian Medical Association Journal*, vol. 74, June 15, 1956, pp. 994–6).

Collins-Williams, C. "Acute Allergic Reactions to Cow's Milk" (*Annals of Allergy*, vol. 13, July–Aug., 1955, pp. 415–21).

——— "The Incidence of Milk Allergy in Paediatric Practice" (*Journal of Paediatrics*, vol. 48, no. 1, Jan., 1956, pp. 39–47).

——— "Respiratory Allergy in Children" (*Ontario Medical Review*, vol. 22, no. 9, Sept., 1955, pp. 750–71).

——— "The Use of ACTH and Cortisone in Childhood Allergies" (*Canadian Medical Association Journal*, vol. 72, May, 1955, pp. 776–7).

Collins-Williams, C. and Best, C. A. "Atmospheric Pollen Counts in Toronto, Canada—Atmospheric Mold Counts in Toronto, Canada" (*Journal of Allergy*, vol. 26, no. 5, Sept., 1955, pp. 461–7, 468–70).

Duncan, Darline; Rhodes, A. J.; McNaughton, G. A.; Johnson, C. C. R. and Wood, W. "Aseptic Meningitis: Isolation of Coxsackie and Unidentified Cytopathogenic Viruses from Cerebrospinal Fluid by Tissue Culture Methods" (*Canadian Journal of Public Health*, vol. 46, Jan., 1955, pp. 1–8).

Jackson, Sanford H. "The Stabilization of the Fluorine Concentration of the Total Ash of Rats" (*Canadian Journal of Biochemistry and Physiology*, vol. 33, no. 1, Jan., 1955, pp. 93–8).

Orlandini, T. O., Sass-Kortsak, A., and Ebbs, J. H. "Serum Gamma Globulin Levels in Normal Infants" (*Paediatrics*, vol. 16, no. 5, Nov., 1955, pp. 575–84).

Rance, C. P. and Chute, A. L., "Treatment of the Nephrotic Syndrome in Children" (*Canadian Medical Association Journal*, vol. 73, Dec. 15, 1955, pp. 959–64).

Rao, K. S. and Prichard, J. S. "Photogenic Epilepsy" (*Journal of Paediatrics*, vol. 47, no. 5, Nov., 1955, pp. 619–23).

Rhodes, A. J. "Poliomyelitis and the School Medical Health Officer" (*Canadian Journal of Public Health*, vol. 46, Sept., 1955, pp. 355–62).

——— "Les Progrès récents dans l'étude de la poliomyélite et des infections semblables à la poliomyélite" (*Bulletin de la Société Clinique de l'Hôpital Civil de Charleroi*, vol. 6, no. 2, avril 1955, pp. 114–21).

——— "Recent Advances in Poliomyelitis of Interest to the Health Officer" (*Canadian Journal of Public Health*, vol. 46, June, 1955, pp. 219–32).

——— "Recent Advances in the Study of Virus Diseases with Particular Reference to Neurotropic Infections" (*Proceedings of the Royal College of Physicians and Surgeons of Canada*, 1954, pp. 40–53).

Rhodes, A. J., Wood, W., and Duncan, Darline. "The Present Place of Virus Laboratory Tests in the Diagnosis of Poliomyelitis, with special reference to Tissue-Culture Techniques" (World Health Organization, *Monograph Series No. 26*, Geneva, 1955, pp. 237–67).

Rowe, Richard D., Vlad, Peter, and Keith, John D. "Atypical Tetralogy of Fallot, a Noncyanotic Form with Increased Lung Vascularity: Report of Four Cases" (*Circulation*, vol. 12, no. 2, Aug., 1955, pp. 230–8).

——— "Selective Angiocardiography in Infants and Children" (*Radiology*, vol. 66, no. 3, March, 1956, pp. 334–61).

Sass-Kortsak, A., Bowden, Drummond H., and Brown, Roderick J. K. "Congenital Intrahepatic Biliary Atresia" (*Paediatrics*, vol. 17, no. 3, March, 1956, pp. 383–91).

Pathological Chemistry

Under the direction of Professor James A. Dauphinee

No changes have occurred among the senior members of the staff during the past year and no alterations of any importance have been made in the teaching programme.

One hundred and forty-six undergraduates in the third medical year and 9 graduate students have been enrolled during the session in courses given by this Department. Of the graduate students 3 are registered in the Graduate School for the Ph.D. degree, 3 are registered for the M.A., and 2 have completed the programme for the B.Sc.(Med.).

The close collaboration between this Department, the clinical departments of the Faculty of Medicine, and the Clinical Investigation Unit of Sunnybrook Hospital has continued and this has permitted the facilities of the Department to be applied to the study of a number of interesting and important clinical problems as is well shown in the report on research.

The work of the Biophysical Laboratory in the sub-department of Biophysics under Dr. Wm. Paul continues vigorously and consists mainly of assisting with clinical investigations which involve the use either of radioactive isotopes or of the photometric blood density devices developed in the laboratory. These facilities are available to any and all of the clinical departments in the faculty. However, this laboratory is now operating to capacity, the range of problems which can be dealt with to advantage has been fairly well settled, the equipment is being used advantageously and it would be difficult to undertake any new problems at the present time without further additions to the staff.

Research

Dr. J. A. Dauphinee and Dr. J. C. Sinclair of the Department of Medicine have continued their detailed studies on patients suffering from a variety of liver disturbances including Laennec's cirrhosis with ascites, primary biliary cirrhosis, obstructive jaundice caused by carcinoma of the hepatic duct, jaundice associated

with chlorpromazine therapy, etc. Among other findings they have shown that ascites in cirrhosis, when associated with low plasma proteins, can be very materially benefited by repeated small transfusions with salt-free human serum albumin. They have also partly clarified the clinical picture presented by patients with that form of jaundice which is caused by carcinoma of the hepatic duct and have suggested how this condition may be distinguished from primary biliary cirrhosis and other causes of jaundice which may resemble it very closely.

Dr. S. J. Klebanoff, post-doctoral N.R.C. Fellow in Medical Research, has been studying the intrinsic factors which control the rate and direction of metabolic processes within intact cells. He has shown that the glutathione system (GSH $\rightleftharpoons$ GSSG) plays an important role in the regulation of the oxidation reduction equilibrium of the cell, particularly in regard to the activity of the other intracellular sulphydryl-disulphide systems. Glutathione would thus appear to exert an important influence on the rate of many biochemical systems *in vitro* and, presumably, of many biological processes *in vivo*. He is also investigating the relationship of the glutathione system to diabetes mellitus and to the proper preservation of blood during storage.

Dr. Anne Patzauer is studying the various anti-diuretic substances which may be excreted in the urine with the object of determining just what part these play in the development of oedema, ascites and other clinical conditions associated with the retention of water and of sodium chloride.

Mr. L. A. W. Feltham is investigating the various factors, hormonal and others, which control the electrolyte content of mammalian muscle.

Graduate students have completed the following theses:

For the B.Sc.(Med.) degree:

CARTER, Dr. ANNJANE. Filter paper electrophoresis in the study of human serum proteins.

DEMPSEY, Dr. HUGH. Plasma copper levels in the normal and in pathological states.

Reported by Professor T. F. Nicholson

The study of the sites of the various activities of the renal tubules using the method of selective unilateral tubular damage has been continued.

It has been shown that the site of action of desoxycorticosterone and of aldosterone in increasing the rate of sodium reabsorption by the kidney is in the proximal tubule, not in the distal tubule as has been commonly believed.

A method for the biological assay of aldosterone which will detect as little as 0.3 micrograms of that substance is being developed.

Further work on the site of acidification of the urine has shown that while the proximal tubule is the major site of hydrogen ion secretion when urines of a pH of below 6.0 are being excreted, the distal tubule is the site of acidification of urines with a pH of between 6.0 and 6.9.

Reported by Professor A. G. Gornall

Mrs. T. Menon has continued her study of factors influencing the *in vitro* action of insulin. The effect of fasting, diabetes, hypophysectomy and adrenalectomy on various tissue phosphatases has been determined.

Mr. M. V. L. Rao is studying the diuretic effect of extracts of gastric and duodenal mucosa, and has shown that this is not due to an antipitressin effect.

Mr. B. Eglitis has been investigating methods for the estimation of adrenalin and nor-adrenalin.

In the Steroid Hormone Laboratory major attention has been devoted to a study of aldosterone. With the skilful use of chromatographic techniques by Mrs. C. Gwilliam and extraction and purification procedures by Mr. A. E. D. Hall, the

minute quantities of this hormone in human urine are being measured. Of special interest is the finding that patients with essential hypertension excrete increased amounts of aldosterone. Miss R. Nakashima has extended her study of the aldosterone fraction released by glucuronidase. In collaboration with Dr. D. Kumar of the Department of Obstetrics and Gynaecology, Mr. Hall and Miss Nakashima have shown for the first time that the administration of very small doses of aldosterone to rats for several weeks produces hypertension. In collaboration with Dr. Kumar, and Dr. W. Anderson of the Department of Pathology, it has been found that the post mortem picture in these animals resembles that of human essential hypertension.

In collaboration with Dr. W. G. Bigelow of the Department of Surgery, Mrs. M. Woodhouse has shown again a statistically significant effect of hibernating gland extracts on cold tolerance. All efforts to obtain a purer, more active fraction, however, have failed. A study of metabolic disturbances in patients during hypothermia is in progress.

In the Clinical Investigation Laboratory Mrs. H. Pavuls and Mrs. V. Reinholds have carried out determinations of adrenal corticoids and nitrogenous substances excreted during metabolic studies of patients with various diseases. Miss D. Strachan, in a study of modifications of the Norymberski procedure, has confirmed its usefulness for the measurement of total 17-ketogenic corticosteroids.

The following problems have been under investigation during the year by Dr. J. A. Dauphinee and Dr. A. G. Gornall in collaboration with clinical departments: (1) "Steroid and metabolic studies in arthritis," with Drs. J. Harrison and M. A. Ogryzlo, Department of Medicine; (2) "Hormonal and metabolic studies in periodic catatonia," with Dr. J. Lovett Doust, Dr. A. Bonkalo and Mr. B. Eglitis, Department of Psychiatry; (3) "Aldosterone excretion by normal persons and hypertensive patients on varying intakes of salt," with Drs. J. Morrow and H. Field, Department of Medicine; (4) "Aldosterone excretion in other clinical syndromes," with the cooperation of several clinical departments; (5) "Metabolic effects of TSH," with Drs. R. Volpe and C. Ezrin, Department of Medicine; (6) "Comparison of uricosuric agents in the treatment of gout," with Drs. M. E. Purdy and M. A. Ogryzlo, Clinical Investigation Unit, Sunnybrook Hospital; (7) "Effect of BZ 55 in a depancreatized patient" with Drs. J. Harrison and M. A. Ogryzlo, Clinical Investigation Unit, Sunnybrook Hospital.

Reported by Professor W. Paul

The study of phospholipid metabolism in man using radiophosphorus as a tracer has been continued by Miss A. Britton in collaboration with Dr. E. A. McCulloch of the Department of Therapeutics. During the past year a mathematical treatment of the results has become available which allows the calculation of turnover time and rates of production in absolute terms. These calculations have confirmed both the remarkable individual constancy of the rate of phospholipid formation and its dependence on endocrine control. The effect of administered ACTH, cortisone and growth hormone and of the diseases of acromegaly, anterior pituitary insufficiency, hyperthyroidism, myxoedema, and Addison's and Cushing's diseases has been investigated in a study which has involved over fifty patients.

Miss Britton and Dr. McCulloch have started an investigation into the acid-soluble phosphorus compounds of leukaemic cells and interesting differences have been observed in acute and chronic myeloid cells and cells from myeloid bone marrow grown in tissue culture.

Dr. K. J. R. Wightman directs the efforts of several clinical groups in the therapeutic applications of radiophosphorus.

Dr. M. W. Johnston continues to direct the extensive use of radioactive iodine in the diagnosis and treatment of certain endocrine disorders involving the thyroid gland.

Dr. H. Hyde has investigated lymphatic flow with the aid of radioactive gold

and is attempting the production of a suitable radioactive arsenical colloid for this purpose.

Dr. Barbara Hazlett is continuing to use radiochromate for the study of blood volumes and red cell survival. Radio Cyanocobalamin is also being utilized for positive diagnosis of pernicious anaemia.

Radioactive phosphorus is being used by Dr. G. A. Thompson to investigate its value in the localization of tumours in the eye. A similar procedure has been well established for brain tumour localization by Dr. T. P. Morley.

The project to develop positron annihilation external scanning for brain tumours by Dr. E. A. Botterell and Dr. W. Paul has reached the clinical stage. The mechanical scanning device has been completed and experiments on phantoms have been successful. Three shipments of Germanium irradiated in the cyclotron of the Physics Department of the University of Birmingham, England, have been received. Preparations of the positron emitting Arsenic 74 separated from the Germanium have been administered as sodium arsenite to laboratory animals with no toxic effects.

Dr. R. W. Gunton and Dr. C. R. Woolf of the Department of Medicine aided by Mr. T. Nelberg have employed the recording oximeter for cardiovascular or pulmonary studies on more than two hundred patients.

Publications

Bruce-Robertson, A., Peppiatt, J., and Dauphinee, J. A. "Paper Electrophoresis in the Study of Plasma and Body Fluid Proteins in Disease"; abstract (*Proceedings of the Royal Society of Canada*, 1955, Programme, p. 55).

Dauphinee, J. A. "Clinical Uses of Radioactive Isotopes"; Chairman's Report to the Faculty of Medicine (*Canadian Medical Association Journal*, vol. 74, no. 10, May 15, 1956, pp. 830–1).

——— "The Teaching of Medicine and the Place of Science in the Education of a Physician"; Presidential Address (College of Physicians and Surgeons of Ontario, Annual Announcement for 1954–5, pp. 94–9).

Dauphinee, J. A. and Bruce-Robertson, A. "The Plasma Proteins in Rheumatoid Arthritis" (*Proceedings of the First Canadian Conference on Research in Rheumatic Diseases*, 1955, pp. 31–44).

Gornall, A. G. "Steroid Hormones and Arthritis" (*Proceedings of the First Canadian Conference on Research in Rheumatic Diseases*, 1955, pp. 21–9).

Gornall, A. G., Gwilliam, C., and Hall, A. E. D. "Microchemical Estimation of Aldosterone in Urine"; abstract (*Journal of Clinical Endocrinology and Metabolism*, vol. 15, no. 7, July, 1955, p. 886).

Kalant, H. "Colorimetric Ninhydrin Reaction for Measurement of Alpha-Amino Nitrogen" (*Analytical Chemistry*, vol. 28, Feb., 1956, pp. 265–6).

Klebanoff, S. J. "Factors Affecting the Activity of Alloxan *in vitro*" (*Canadian Journal of Biochemistry and Physiology*, vol. 33, no. 5, Sept., 1955, pp. 780–91).

Kumar, D., Hall, A. E. D., Nakashima, R., and Gornall, A. G. "Cumulative Effect of Aldosterone in Rats"; abstract (*Revue canadienne de biologie*, vol. 14, 1955, p. 265).

Paul, W. "Analogue Computer for A.C. Oximetry" (*Journal of Scientific Instruments*, vol. 32, 1955, p. 286).

Pathology

Under the direction of Professor J. D. Hamilton

There have been no changes in graduate or undergraduate courses given by this Department during the past year.

In last year's report it was mentioned that the various activities of this Department appeared to be out of balance and in conflict. In an attempt to overcome some of the objections to the undergraduate course in Pathology, the curriculum of the

third medical year is now being explored with the objective of distributing the teaching of pathology over the whole year instead of confining it to the first quarter. It is hoped that the curriculum may be altered to permit third year students to receive group instruction at the various hospitals once a week during the academic year.

It is with great regret that the resignation of Professor R. C. Ritchie has been accepted. Dr. Ritchie's contribution to the teaching and especially to the research activities of this Department will be greatly missed.

DIVISION OF NEUROPATHOLOGY

Under the direction of Professor E. A. Linell

The routine work of the Division has continued satisfactorily and the weekly clinics and pathological conferences have been a very important feature of the teaching programme.

Research

Dr. J. D. Hamilton has continued to collaborate with Dr. Gerald Wrenshall of the Banting and Best Department of Medical Research in an investigation of diabetes mellitus. With the assistance of Dr. J. H. Mowbray the study of coronary disease has made great progress. During the past year Dr. Mowbray has collected and analysed 100 cases from our autopsy service. From this work two papers are being prepared for publication. The anatomical study of the lungs and bronchi in smokers and non-smokers has also made great progress owing to the diligence and meticulous care with which Dr. Sepp has pursued this problem. Sufficient data have now been accumulated to complete the study, and the final report is being submitted to the National Cancer Institute.

Dr. H. J. Barrie in collaboration with Dr. P. G. Urback has written a paper on the healing of cardiac infarcts. With Dr. Siebenmann, Dr. Barrie has been assessing the results of chemotherapy on tuberculosis in rabbits. Dr. Barrie has now completed his instructions for pathologists performing autopsies on victims of air crashes.

Dr. B. Balshin has made studies on bronchiolitis obliterans and calcific disease of the aortic valve.

Dr. J. R. Hilliard has investigated the pathologic changes in scleroderma with special reference to the renal lesions.

Dr. H. J. Watt has written a review of massive thrombosis of the pulmonary artery and has made a study of our collected cases of thrombotic thrombocytopenic purpura.

Dr. R. C. Ritchie has continued his researches on lymphosarcoma in maskinonge, with the assistance of Dr. Ichiro Urushizaki. Dr. Ritchie has suffered a severe set-back this year in that the fingerlings for which the experiments to determine infectivity were planned were all killed by sudden changes in the water temperature. Nonetheless an important contribution concerning the changes in the formed elements of the blood of the tumour-bearing fish has been made by Drs. Ritchie and Urushizaki.

Dr. Calvin Ezrin, with the assistance of Dr. Horsey and Dr. J. W. Dawson, has continued his investigations on the pituitary and the hypothalamus. With the completion of suitable accommodation for monkeys, and the obtaining of a supply of them, this work has made great progress during the past year.

Dr. Ritchie MacKay, who succeeded Dr. Blaisdell in the project concerned with neonatal and stillbirth mortality, completed this project in March of this year. It was decided that it need not be continued, since further progress depended upon introduction of methods established for investigation of neonatal deaths into the various teaching hospitals of the city.

Dr. William Anderson has continued his researches on degenerations of the rotator cuff and related changes, as well as his investigations of osteoarthritis. With

the perfection of a technique for cutting sections of undecalcified bone, Dr. Anderson is now hopeful of progressing more rapidly than he has in the past with the studies of bone. His work has aroused great interest and he is collaborating with the Department of Medicine in a study of metabolic disorders of bone. In collaboration with the Department of Pathological Chemistry the study of rats made hypertensive by the administration of aldosterone is now completed, and the report on it is being prepared for publication. Reviews of cancer of the thyroid, lymphoepithelioma, and Hodgkin's disease have now been completed in collaboration with Dr. R. A. Mustard, Dr. O. H. Warwick, and Dr. Vera Peters, respectively. Dr. Anderson has presented, with great success, a paper to the American Society of Plastic Surgeons on "The Nature of Dupuytren's Contracture and Related Conditions," and one to the Toronto Radiological Society on "The Nature of Aneurysmal Bone Cysts."

Dr. C. R. McLean and Dr. William Anderson have instituted a weekly conference of hospital pathologists, which has proved to be a great success.

Division of Neuropathology

Reported by Professor E. A. Linell

Members of the staff have undertaken the following research work:

Dr. M. I. Tom has prepared for publication (in collaboration with Dr. C. L. Aszkanazy), an article on three cases of virus encephalitis.

The combined clinical and pathological study of "Cerebral Astrocytomata" by Drs. Linell, Tucker and McKenzie will shortly be published in the Proceedings of the 2nd International Congress of Neuropathology.

Dr. T. P. Morley has made headway in his tissue culture of brain tumours. He gave a paper during the winter to the surgical staff of the Toronto General Hospital. He is preparing a paper for delivery in England this summer.

Publications

Bowden, D. H. and Donohue, W. L. "Jaundice in the Neonatal Period" (*American Journal of Medical Sciences*, vol. 230, no. 3, Sept., 1955, pp. 305–16).

Clark, R. M. and Anderson, W. "Rheumatic Activity in Auricular Appendages Removed at Mitral Valvoplasty" (*American Journal of Pathology*, vol. 31, no. 5, Sept.–Oct., 1955, pp. 809–19).

Donohue, W. L. "Interstitial Plasma Cell Pneumonia" (*Laboratory Investigation*, vol. 5, no. 1, Jan.–Feb., 1956, pp. 97–105).

Donohue, W. L., Playfair, F. D., and Whitaker, L. "Mumps Encephalitis: Pathology and Pathogenesis" (*Journal of Paediatrics*, vol. 47, no. 4, Oct., 1955, pp. 395–421).

Hamilton, John D. "Coronary Artery Disease" (*Journal of Arkansas Medical Society*, vol. 52, no. 1, June, 1955, pp. 4–10).

Kumar, D., Anderson, W., and Van Wyck, D. "Ovarian Carcinoma Arising in an Endometrial Cyst" (*Journal of Obstetrics and Gynaecology of the British Empire*, vol. 62, no. 3, June, 1955, pp. 375–7).

Moffat, F. and Anderson, W. "Adenoma of Brunner's Gland" (*British Journal of Surgery*, vol. 43, no. 177, July, 1955, pp. 106–7).

Sherry, J. B. and Anderson, W. "The Natural History of Pigmented Villonodular Synovitis of Tendon Sheaths" (*Journal of Bone and Joint Surgery*, vol. 37A, no. 5, Oct., 1955, pp. 1005–11).

Pharmacology

Under the direction of Professor J. K. W. Ferguson

In May 1956 the President announced the appointment of Dr. Harry Cullumbine as Professor of Pharmacology and Head of the Department to succeed Dr. J. K. W. Ferguson who was appointed Director of the Connaught Medical Research

Laboratories, effective October 1, 1955. Dr. Cullumbine is well known in Canada as a result of several visits to this continent in connection with defence medical research. For the last four years he has been Superintendent of the Medical Division of the Chemical Defence Experimental Establishment at Porton, England. Before that he was Professor of Physiology and Pharmacology in the University of Ceylon, Colombo.

Since Dr. Cullumbine was unable to assume his new duties until July 1, 1956, most of the teaching and direction of research during the last year was done by Professor G. H. W. Lucas and Professor W. Kalow. As in previous years, the major courses were given to the second medical year, the second dental year, the fourth year in Pharmacy, and to graduate students registered in this and other departments. Clinical-pharmacological conferences for students of the third medical year were directed with outstanding success by Dr. D. M. Young, with the co-operation of other members of the Departments of Medicine and Pharmacology.

In December 1955 a generous benefaction to the Department of Pharmacology for the assistance of research was established by Mrs. Velyien E. Henderson. It is to be known as the Velyien Ewart Henderson Fund in memory of the first Professor of Pharmacology in the University of Toronto, and one of Canada's foremost scientists.

Research

Members of the staff have undertaken the following research work:

Professor G. H. W. Lucas has continued the studies begun by Dr. Ferguson on substances which alter the metabolism of alcohol, and the studies relating to alcohol and road traffic. With the assistance of Mr. D. H. McCurdy, the purity of cyanamide preparations intended for clinical use has been investigated and the LD50 determined on rats and mice. With Mr. R. Aston, studies on the estimation of small quantities of acetaldehyde in air have been continued. With Mr. H. Salem further investigations on suitable plastic containers for expired air containing alcohol have been proved fruitful. In this connection, exhaustive studies have been made on the Breathalyser, an instrument for measuring small quantities of alcohol in air. These studies were supported by the Alcoholism Research Foundation of Ontario.

Dr. W. Kalow has continued his kinetic studies on human serum cholinesterase and has discovered an atypical form of this enzyme in some individuals. A screening procedure suitable for rapid checking of large numbers of sera has been worked out. With Dr. N. Staron the pattern of inheritance of this atypical esterase has been investigated. Studies were made with Mr. K. Genest on the nature of the structural abnormality of the enzyme. In co-operation with the Department of Anaesthesia and with Dr. D. Gunn of the Ontario Hospital, New Toronto, a prolonged action of the muscular relaxant, succinylcholine, was established in patients having the atypical esterase. With Mr. R. O. Davies, the alkaline hydrolysis of succinylcholine has been studied after the development of paper chromatographic methods. Determinations of procaine in blood were made with Miss M. O. Maykut in research supported by the Shouldice Surgery.

Graduate students have completed the following theses:

For the M.A. degree:

Davies, R. O. Studies concerning succinylcholine hydrolysis; Parts I and II.
Hashmi, M. H. Acute toxicity and pharmacologic activity of 7(halogenated alkyl) theophyllines.
Salem, H. Polyethylene plastic bags as containers for air containing ethanol.

For the Ph.D. degree:

Dyer, A. E. Fibrillation and defibrillation following chloroform and epinephrine.
Lindsay, H. A. Serum esterases of man in health and disease.

Publications

Ferguson, J. K. W. "A New Drug for Alcoholism Treatment: I, A New Drug for the Treatment of Alcoholism" (*Canadian Medical Association Journal*, vol. 74, no. 10, May 15, 1956, pp. 793–5).

Kalow, W. "The Relation of Plasma Cholinesterases to Response to Clinical Doses of Succinylcholine" (*Canadian Anaesthetists' Society Journal*, vol. 3, no. 1, Jan., 1956, pp. 22–30).

Kalow, W., Genest, K., and Staron, N. "Kinetic Studies on the Hydrolysis of Benzoylcholine by Human Serum Cholinesterase" (*Canadian Journal of Biochemistry and Physiology*, vol. 34, no. 3, 1956, pp. 637–53).

Kalow, W. and Lindsay, H. A. "A Comparison of Optical and Manometric Methods for the Assay of Human Serum Cholinesterase" (*Canadian Journal of Biochemistry and Physiology*, vol. 33, 1955, pp. 569–74).

Kalow, W. and Maykut, M. O. "The Interaction between Cholinesterases and a Series of Local Anesthetics" (*Journal of Pharmacology and Experimental Therapeutics*, vol. 116, no. 4, April, 1956, pp. 418–32).

Lucas, G. H. W. "Contribution of Alcohol to Motor Car Accidents" (*Canadian Services Medical Journal*, vol. 11, Dec., 1955, pp. 1–3).

McColl, J. D., Parker, J. M., and Ferguson, J. K. W. "A Comparison of the Relative Toxic, Emetic and Convulsive Actions of a Series of Methylated Xanthine Derivatives" (*Journal of Pharmacology and Experimental Therapeutics*, vol. 116, no. 3, March, 1956, pp. 343–50).

Warson, M. D. and Ferguson, J. K. W. "Effects of Cyanamide and Ethanol on Bleeding Weight and Blood Acetaldehyde in Mice and Rats" (*Quarterly Journal of Studies on Alcohol*, vol. 16, Dec., 1955, pp. 607–13).

Physiology

Under the direction of Professor Charles H. Best

The teaching activities of the Department continued in much the same manner as last year.

The programme of the Physiological Society of the University of Toronto opened this session with the presentation of the Croonian Lecture, given in June, 1955, at the Royal Society of London by Professor Charles H. Best. The visitors and the subjects they presented included Lt. Cdr. J. H. Bathurst, O.B.E., D.S.C., R.C.N., "Problems in underwater physiology"; Dr. L. B. Jaques of the University of Saskatchewan, "Current studies in anticoagulants"; Dr. Audrey Smith of the National Institute for Medical Research, London, "Effects of extreme cold on living cells, tissues and whole animals"; Dr. J. A. F. Stevenson and Mr. D. G. Montemurro of the University of Western Ontario, "The hypothalamus in water and energy exchange." The members of the staff who presented papers were Dr. R. E. Haist, Dr. C. G. Hunter, Dr. A. M. Rappaport, Dr. J. W. Scott and Dr. G. F. Wilgram. Under the auspices of the School of Graduate Studies Dr. S. Weinhouse of the Lankenau Hospital, Philadelphia, gave three very interesting lectures on the intermediary metabolism of normal and neoplastic tissues.

Research

Members of the staff have undertaken the following research work:

In Professor R. E. Haist's section, studies of shock secondary to injury and the effects of certain agents influencing carbohydrate metabolism and the islets of Langerhans have been continued. Mr. H. Schachter, Mr. J. R. Hamilton, Mr. S. Sidlofsky and Dr. D. G. Baker found that previous acclimatization to cold retarded the fall in body temperature and oxygen consumption in shocked rats, and under some circumstances prolonged survival. The previous administration of thyroxine diminished the fall in body temperature but shortened survival in shocked rats, and

ACTH had no demonstrable effect. Mr. Hamilton and Mr. Schachter have been attempting to find the optimal environmental conditions of temperature and humidity for shock therapy. Dr. Rosemary D. Hawkins, Dr. M. A. Ashworth and Mr. T. L. Friedlich have investigated effects of certain hypoglycaemic agents. They found that carbutamide (BZ-55) administration in the rat reduced the absorption of glucose from the gut, diminished the activity of the enzyme which frees glucose in the liver (hexose-6-phosphatase), and over a period of time increased the weight of the islets of Langerhans, indicating islet stimulation. Dr. Hawkins has also been investigating a hyperglycaemic agent in certain preparations of phosphatase. Dr. Ashworth and Mr. B. Kinash have been examining the effects of a number of different procedures on islet weight in rats. Miss C. J. Merritt has been investigating the effects of the administration of large doses of insulin, and of the continuous infusion of glucose on the islets in rabbits. Dr. Pushpa Raghunath, from India, has been studying the influence of the continuous infusion of sodium acetoacetate on blood sugar and carbohydrate tolerance in the rat. Dr. S. V. Feinman has continued his studies on the association of pancreatic and hepatic disorders in experimental animals.

In Professor J. Campbell's section, influences of hormones on metabolism have been studied. Mr. L. Chaikof, Mr. R. Zemel and Mrs. V. Lazdins, with the co-operation of Dr. J. Markowitz and Dr. G. A. Wrenshall, found that the responses to purified growth hormone (hyperglycaemia, lipaemia, glycosuria, ketonuria, increases in the weights and lipid contents of the liver and kidneys, and decreases in the insulin extractable from the pancreas) are greater in normal than in hypophysectomized dogs. The implications of these unexpected results are of interest. Evidence of impairment of liver function following hypophysectomy has been obtained. Treatment with growth hormone restored function to normal. Mr. R. A. C. Stirling and Mrs. Lazdins, in an investigation of protein metabolism, find that in animals that have no endogenous supply of these hormones, the administration of insulin causes nitrogen retention, while growth hormone appears to have the opposite effect. This is in marked contrast to the actions of these hormones in intact animals. Dr. E. Schönbaum and Mrs. M. Davidson are studying the concentrations of co-enzyme A in the tissues of animals in differing physiological states. This substance is a co-factor required in the oxidation and synthesis of fats, and the findings should aid in the correlation of enzymatic reactions with the metabolism of tissues.

In Dr. C. G. Hunter's section, which is devoted to radiation studies financed by the Defence Research Board, Dr. Hunter and Dr. D. G. Baker have studied the altered physiology of the acutely irradiated animal and the external radiation injury of radioactive "fallout." Dr. J. C. D. Barlow's researches were concerned with the protection afforded the irradiated animal by hypothermia, by tranquillizing drugs and by bone-marrow cells. Dr. H. E. Roberts continued researches into the effect of hyperoxia and cysteine on radiation injury. Dr. Schönbaum, Mrs. Davidson and Mr. G. R. Green investigated the adrenal gland and the parameters defining *in vitro* cortical activity. Mrs. P. C. Barrow followed the possible nutritional factors of cardiovascular disease and its modification by cold and endocrine factors.

In Professor J. Markowitz's section, advantage was taken of the newly developed technique for removal of the hypophysis, to investigate in dogs, in co-operation with Professor Campbell's group, the chemical changes produced by removal of the pancreas and hypophysis at one operation. The procedure turned out to be feasible, even when corticosteroids and pituitary hormones were withheld after operation.

In Professor A. M. Rappaport's section, Dr. L. Najar, from Mexico, devised a method which permits the continuous perfusion of the spleen, *in situ*, for over two weeks. Preliminary experiments by Dr. Najar on hepatic or systemic autoperfusion of dogs in haemorrhagic shock delayed or even prevented the onset of the irreversible phase. The study of fat phanerosis was continued with Drs. C. C. Lucas and Jean M. Patterson. In a preliminary study initiated by Dr. Best, a series of jejunal, ileal, caecal, cholecystic and peritoneal pockets, designed for the absorption of con-

tinuously delivered insulin, was prepared. The changes in blood sugar, however, as tested by Dr. J. M. Salter, have not yet proved consistent. Dr. J. W. Scott investigated the brain-wave pattern of trained, unanaesthetized normal dogs, tracing the deterioration after surgically induced hepatic coma.

In Professor F. C. Monkhouse's section, tissues of different animal species have been examined for heparin content. Hypophysectomy caused an increase in the heparin content of dog tissue. A fraction containing a high concentration of antithrombin has been isolated from beef plasma. Further attempts at purification of this material, using adsorption and electrophoresis techniques, are in progress. Dr. S. A. A. Zaidi, from Pakistan, has made a study of different methods for the isolation of antihaemophilic globulin. The results of this study have been submitted in partial fulfilment of the requirements for the degree of Bachelor of Science (Medicine).

In Professor D. W. Clarke's section, Mr. I. Keltz has studied the effects of different sodium and potassium concentrations upon the oxygen consumption of yeast cells. This work is a continuation of the general problem of an investigation of the effects of these ions upon metabolic processes. Studies on the extractable glucagon of pancreas have been undertaken in conjunction with Dr. G. A. Wrenshall, and Dr. J. Mayer of Harvard University. The effects of glucagon administration have been studied with Dr. J. M. Salter. Mr. H. Senman, from Turkey, financed by the Connaught Medical Research Laboratories, has started a study of the effects of the new oral insulin-adjuvants upon carbohydrate metabolism.

In Dr. J. W. Scott's section the studies of hypothermia for neurosurgery have been continued. Mrs. M. J. Kerr has investigated oxygen saturation pH and carbon dioxide content of blood from hypothermic patients. During the summer Mr. J. H. N. Deck assisted Mrs. Kerr in studying the effect of anaesthetic agents upon the blood chemistry in dogs during hypothermia. Dr. J. K. C. Murray has been studying the effect of temperature on spinal cord reflexes in the cat. He has presented this work as a B.Sc. (Med.) thesis. Dr. D. Cappon has collaborated actively in studies of sleep and dreams.

Graduate students have completed the following theses:

For the M.A. degree:

Sirek, Mrs. A. A cytological and histochemical study of the cyclical changes in the seminiferous epithelium and their disturbances due to nutritional deficiencies.

For the Ph.D. degree:

Henderson, Miss M. J. Effects of insulin on rates of glucose transfer in the depancreatized dog.

Josseau-Kalant, Mrs. O. The effects of hormonal and environmental factors on the metabolism of the adrenal glands and the effect of prolonged exposure to cold on the metabolism of skeletal muscle.

Publications

Ashworth, M. A. and Haist, R. E. "Some Effects of BZ-55 (Carbutamide) on the Growth of the Islets of Langerhans" (*Canadian Medical Association Journal*, vol. 74, June 15, 1956, pp. 975–6).

Barlow, J. C. and Sellers, E. A. "The Effect of Growth Hormone on Recovery from Exposure to X-radiation" (*Radiation Research*, vol. 2, July, 1955, pp. 461–6).

Barrett, J. L., Nishikawara, M. T., and Haist, R. E. "Effects of Hypophysectomy and of Undernutrition on Amylolytic Activity of the Pancreas of the Rat" (*American Journal of Physiology*, vol. 182, July, 1955, pp. 35–8).

Campbell, J. and Best, C. H. "Physiological Aspects of Ketosis" (*Metabolism*, vol. 5, March, 1956, pp. 95–113).

Campbell, J. and Lazdins, V. "Effect of BZ-55 on Dogs: II, Observations on Depancreatized and Metahypophyseal Diabetic Dogs" (*Canadian Medical Association Journal*, vol. 74, June 15, 1956, pp. 962–5).

CLARKE, D. W. "The Influence of Potassium Ion upon Glucose Uptake and Glycogen Synthesis in the Isolated Rat Diaphragm" (*Canadian Journal of Biochemistry and Physiology*, vol. 33, 1955, pp. 687–94).

——— "The Effects of Adrenal Cortical Extracts upon Carbohydrate Metabolism when Medium Composition is altered" (*ibid.*, vol. 33, 1955, pp. 845–8).

CLARKE, D. W., DAVIDSON, M., SCHÖNBAUM, E., and SENMAN, H. "Some *in vitro* Studies with BZ-55" (*Canadian Medical Association Journal*, vol. 74, June 15, 1956, pp. 966–8).

FRIEDLICH, T. L., ASHWORTH, M. A., HAWKINS, R. D., and HAIST, R. E. "An Effect of BZ-55 (Carbutamide) on the Rate of Absorption of Glucose from the Gastrointestinal Tract" (*Canadian Medical Association Journal*, vol. 74, June 15, 1956, pp. 973–4).

HAWKINS, R. D., ASHWORTH, M. A., and HAIST, R. E. "The Effect of BZ-55 (Carbutamide) on Glucose-6-phosphatase Activity" (*Canadian Medical Association Journal*, vol. 74, June 15, 1956, pp. 972–3).

MARKOWITZ, J. and ARCHIBALD, J. "Transbuccal Hypophysectomy in the Dog" (*Canadian Journal of Biochemistry and Physiology*, vol. 34, May, 1956, pp. 422–8).

RAPPAPORT, A. M. "Anatomic Considerations"; in *Diseases of the Liver*, ed. L. Schiff, pp. 1–41. Philadelphia: J. B. Lippincott Company. 1956.

SELLERS, E. A. and BARLOW, J. C. "The Response of Hypophysectomized Rats to X-radiation and Replacement Therapy" (*Radiation Research*, vol. 2, Aug., 1955, pp. 534–7).

SELLERS, E. A. and YOU, R. W. "Deposition of Fat in Coronary Arteries after Exposure to Cold" (*British Medical Journal*, vol. 1, April 14, 1956, pp. 815–19).

SMITH, L. C. and HAIST, R. E. "The Efficacy of Dextrans of Different Molecular Weights in Shock Secondary to Limb Clamping" (*Canadian Journal of Biochemistry and Physiology*, vol. 33, 1955, pp. 553–61).

Psychiatry

Under the direction of Professor A. B. Stokes

General Considerations

The clinical services associated with the Department of Psychiatry represent the changing pattern of treatment facilities in the field of mental illness. The Toronto Psychiatric Hospital maintains active in-patient and out-patient services as well as divisions devoted to the special problems of children, industry, and the courts. Each of the University teaching hospitals—the General Hospital, the Western Hospital and St. Michael's Hospital—has a psychiatric unit with related out-patient clinics. The Neuropsychiatric Division of the Sunnybrook Hospital serves the veterans' needs, the Department of Psychological Medicine in the Hospital for Sick Children meets the problems of emotionally disturbed children. The Toronto Mental Health Clinic, the Family Court Clinic, the Brookside Clinic are community organizations serving social agencies, problem families, and alcoholics. Finally and recently the Ontario Hospital, Toronto (Queen Street), with new in-patient and out-patient services, typifies a mental hospital in service relationship to its neighbourhood.

Clearly the segregating of behaviourally disturbed patients in distant mental hospitals and the casual placating of emotional upsets within the family circle are functions of an older medical practice. Now the disabilities of mental disorder, grave as they are, may be approached with a sufficient optimism in terms of careful study and practical relief to warrant treatment arrangements similar to those accorded organic illness and in keeping with the essential worth of suffering humanity. The warranty however raises important issues of University-community relationships.

The setting up of medical services, if they are to be effective, is a consequence of knowledge discovered by research and communicated by teachers. Teaching and research are primarily University functions: treatment facilities are primarily a community responsibility. A balance of concern is evident in any association of university and community for health purposes. Sometimes there is an extreme overweighting, on the one side by the urgent demands of unrelieved sickness, much more rarely on

the other by a detached unrealistic assertion of intellectualism. The correction of imbalance is a continuous organizational necessity in any university clinical department.

The Department of Psychiatry suffers an imbalance overweighted by service needs. The expansion of treatment facilities in the developing mental health field creates a demand for personnel. The demand is so great that the University association may be welcomed at the present time more for quantitative help in immediate service than for qualitative influence on future effectiveness. The qualitative factors inherent in teaching, learning, and discovery give way to quantitative man-hour factors addressed to increased admission and discharge rates.

The dozen clinical organizations associated with the Department of Psychiatry as teaching centres are in great degree manned for service purposes by thirty to forty graduate physicians in psychiatric training. The cost is rarely a charge on the service organization: the financial support ultimately originates from educational bursaries. Without the educational relationship the clinical services would shrink: with the present clinical relationship the educational development is impeded.

The problem is difficult in resolution: much effort and goodwill are directed, from both sides, to the conservation of teaching-learning time and to finding monies without encumbrances for University purposes. But in the long run the University requirement is a modern psychiatric institute where teaching and research, adequately financed, are based on exemplary but unharassed clinical investigation and treatment.

Particular Considerations

Consideration of a new psychiatric institute has continued over the past year. Important committee work, outside the Department, has corrected departmental thinking in a series of practical recommendations.

The graduate training programme continues actively: thirty-seven physicians are enrolled. Eleven candidates were successful in the 1955–6 diploma examinations. Of the diploma-holders of past years fifteen were successful in the Certification examinations of the Royal College of Physicians and Surgeons of Canada: one was awarded the Fellowship in Medicine as modified for Psychiatry.

An advanced postgraduate course for senior psychiatrists on the Biology of Schizophrenia was organized over a ten-week period by Dr. J. Lovett Doust. The number of registrants was over 100 with representation from all over the Province. A similar course on psychiatric social work was equally successful.

The standard of the 1956 graduating class was only fair in Psychiatry. An increased number of hours for undergraduate teaching has allowed a better exposure to the clinical problems as they present themselves in hospital and from the community.

Training courses for nurses, psychologists, social workers, occupational therapists, and other groups have been actively developed.

Members of the teaching staff have delivered a number of invitation lectures to professional and other university groups.

Additional appointments to the teaching staff have been made for 1957. The increase is related to the recognition of the Ontario Hospital, Toronto, as a teaching mental hospital and the organization of a forensic out-patient clinic with teaching responsibilities.

The support of the R. Samuel McLaughlin Foundation, the McLean Foundation, and the Bursary Committee of the Medical Alumni Association in providing for graduate students abroad is gratefully acknowledged. Many private subscribers have contributed generously to the Psychiatry Advancement Fund.

The Dominion-Provincial Mental Health Training Grants and the Mental Health Research Grants, despite the difficulties of their administration, have contributed greatly to very worthwhile developments. The Minister of Health of the Province of Ontario, and his administration, have given continuous support.

The Council of the Medical Faculty and the Academic Council of the Department have offered wise criticism and suggestions. Colleagueship within the Department has been exemplary.

Research

Physical, psychological and social researches into the problems of psychiatry have continued actively over the past year. Although the efforts may seem multifarious, nonetheless each element relates to the others in a whole pattern of approach.

Dr. J. Lovett Doust and his team of workers in the research laboratories have studied immediate reactions to stressor situations, variations in reactive response over a time period and maturational poise as a factor in response. An examination of reactions to sensory rhythmic bombardment, using visual, auditory and tactile stimuli, has continued. With Dr. M. Salna important pathophysiological effects in the peripheral capillary system have been found in conjunction with the various diagnostic categories of psychiatric disorder, and in relation to transient episodes of hallucinatory experience. Slowing of the capillary blood flow, lowered oxygen saturation of the capillary blood, sedimentation of corpuscles in the capillaries have emerged as transitory phenomena associated with reversible effects in the cellular ground substance. The effects and their reversals recur in rhythmic sequences, the rate and nature of which seem at the present stage of investigation to be of fundamental importance, possibly related to central nervous system discharges. Dr. Lovett Doust and Dr. Salna, with support from the insulin research fund, have examined these capillary effects in patients undergoing deep coma insulin therapy. With Mr. H. Husdan blood histamine studies have been carried out, using a new modification of technique, alongside the oximetric and capillary investigations. It seems clear that increase of blood histamine is associated with the capillary pathophysiology of the severer mental disorders. With Dr. L. Coleman, and in co-operation with the Institute of Child Study, an investigation into developmental norms for each stage of growth has been started.

In association with the Department of Pathological Chemistry, Dr. Lovett Doust and Dr. A. Bonkalo have gone further into the physiological parallels of chemical and metabolic rhythms evident in cases of periodic catatonia. The mesh of change and exchange relationships in these interesting cases escapes a simple elucidation. Nonetheless progress has been made in understanding thyroid function: the use of tri-iodothyronine has proved effective in correcting the disturbed mental state.

Dr. J. Goodwin and Dr. Bonkalo have furthered their electroencephalographic studies. Dr. Bonkalo's observations on the alpha rhythms of psychiatric patients have focussed interest on the variations of alpha rate in the same patient over a time period. There is no doubt that these occur rhythmically, but in differing phase, in the periodic catatonic patients. The use of the alpha rate as a prognostic indicator in lobotomy has been extended to the field of electroplexy with some interesting findings: the involutional depressions do best with electroplexy when the alpha rate is slow.

Dr. M. Sloane has continued his search for anatomical relationships in the limbic lobe system relevant to an ultimate understanding of psychosomatic effects.

Dr. B. Quarrington and his associates have pursued their studies into the Rorschach test. With Mr. L. Gelfand the criteria of test evaluation have been critically examined. With Dr. S. Neiger the application of the newer Merei method to research problems is being explored. Dr. Quarrington, Mr. Gelfand and Mr. White have looked at learning and unlearning inflexibility as an aspect of psychiatric disability. Using a two-hand co-ordinator they have tested their hypothesis on groups of normals and patients; with the support of the Alcohol Foundation they are applying their research method to the problem of the alcoholic.

Mr. E. Douglass, in association with his psychologist colleagues, is investigating the developmental aspects of speech function: this investigation has relevance to

the difficulties in communication found in connection with psychiatric disorders.

Mr. F. Toombs has concluded his "in plant" investigations in an industrial setting. His findings demand a revision of such concepts as Mental Health in Industry and call for a re-examination of the life experiences which are taken into the work situation distorting and confusing human communications within the vocational matrix. Mr. J. Seeley, Mr. A. Sim and Miss E. Loosley have published their researches on a Toronto suburban community. Dr. J. Rich, in association with Dr. K. G. Gray, has followed up, after a five-year interval, offenders originally admitted from the courts for an investigation of mental state. In addition Dr. Rich has interested himself in the incidence of sexual offences whether or not court action has followed. Dr. T. Mallinson and Mr. L. Lawson have attempted a measurement of the effect of group work in a psychiatric ward setting: the investigation has relevance to the problem of rehabilitation.

Clinical research has been a vital influence within the clinical services associated with the Department of Psychiatry.

Dr. J. D. Armstrong has furthered his studies of alcoholism in conjunction with his work at the Alcohol Foundation.

Dr. D. Cappon has studied the structure of phantasy and dreams particularly in patients subject to organic disease. Further he has investigated the value systems of patients referred for psychotherapy.

Dr. J. G. Dewan, in association with Dr. W. B. Spaulding, has continued to investigate the acute psychiatric disorders of physical origin despite the absence of obvious signs of organic disease.

Dr. M. V. Jackson and Dr. Spaulding are reporting on the toxic effects of prescribed medicamenta in producing florid psychiatric disturbances.

Dr. A. Miller and Dr. D. J. McCulloch have studied the pharmacological effects of the newer tranquillizing drugs on mental upsets.

Dr. W. R. Mitchell has given attention to temporal lobe dysfunction not only in terms of temporal lobe epilepsy but also in relation to thought disorder and deviant sex behaviour. He has continued to study the relationship of laterality of organic pathology to the diagnostic pattern of mental breakdown.

In summary a modicum of very important discovery and much that is creditable have emerged from the year's research efforts. Colleagueship in exploration, enlivenment of thinking and respect for honest criticism make up additional gains which the research workers have brought to the Department in full measure.

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——— "Stress and Psychopathology in Stutterers" (*Canadian Journal of Psychology*, vol. 10, no. 1, March, 1956, pp. 31–7).

——— "Studies on the Physiology of Awareness: Consciousness of the Duration of Time in Psychiatric Patients" (*Diseases of the Nervous System*, vol. 16, no. 12, Dec., 1955, pp. 363–5).

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Radiology

Under the direction of Professor A. C. Singleton

The teaching in the diagnostic department has been similar to that of the previous year, with further extension of teaching in conjunction with other departments. Participation in postgraduate courses in Medicine, Surgery, Obstetrics, Otolaryngology, and Ophthalmology has been continued. The installation of a new biplane angiocardiographic unit has led to increased participation in and extension of the teaching of cardiology.

Museum facilities at the Toronto General Hospital and at Sunnybrook Hospital have been further improved.

One candidate, Dr. K. E. Hodge, was successful in obtaining his Fellowship in the Royal College of Physicians and Surgeons of Canada and five candidates obtained their diploma in Medical Radiology, University of Toronto.

Teaching in radiotherapy has been further extended at the postgraduate level, further teaching in radiotherapy and radiation physics being given to our D.M.R. students.

Dr. O. B. Millar resigned from the active staff of the Department of Radiotherapy as of June 30, 1955. Dr. W. E. C. Allt, previously of the staff of the Meyerstein Institute, the Middlesex Hospital, London, England, joined the staff of this Department as of September 1, 1955. Dr. O. H. Warwick joined the staff of the Department of Radiotherapy on August 1, 1955, as Consultant in Internal Medicine.

Research

Dr. K. F. MacEwen, in conjunction with Dr. I. B. MacDonald of the Department of Surgery, is continuing research into the correlation of radiological and surgical findings in gall bladder disease, and also, in conjunction with Dr. W. A. Dafoe of the Department of Obstetrics and Gynaecology, is continuing research into the function of the gall bladder during pregnancy.

Dr. K. E. Hodge, with Dr. W. H. Allemang of the Department of Obstetrics and Gynaecology, has conducted research into the gravitational method of placentography. The result of this research is shortly to be published. Dr. Hodge is also conducting research into placental localizations by angiographic methods. In conjunction with Dr. J. M. Low of the same Department, he has commenced research on stress incontinence.

Dr. L. R. Harnick, in conjunction with Dr. Owen Gray of the Department of Surgery, has conducted research in the correlation of radiological and surgical findings in intravenous cholangiography. In conjunction with Dr. G. H. C. Joynt of the Department of Surgery, he has been conducting clinical and radiological research into "Round Lesions in the Chest."

Dr. D. T. Burke has been conducting research on stereoscopic projection of full size X-ray films.

Dr. R. B. Holmes, in conjunction with Dr. W. F. Greenwood of the Department of Medicine and Dr. W. H. Bigelow of the Department of Surgery, has been conducting an investigation of cardiac and peripheral vascular disease by angiocardiographic means.

Dr. J. D. Munn has been conducting clinical research into the results of treatment of injuries about the elbow joint. In conjunction with Dr. A. Sass-Kortsak of

the Department of Paediatrics, he has been studying methods of radiological investigation of portal hypertension. With Dr. Donald Fraser of the Department of Paediatrics, he has been investigating metabolism of bone with particular reference to hypophosphatasia; and with Dr. Ford Walker and Dr. Richard Roe, both of the Department of Paediatrics, he has been conducting research in the radiological investigation of the pelvis, hips and skulls in mongols.

Dr. C. L. Ash and Dr. M. Vera Peters, in conjunction with Dr. John Bean of the Department of Obstetrics and Gynaecology, have continued the investigation into the incidence and development of hydronephrosis in Stage I and II carcinoma of the cervix treated by radiation therapy (intravenous pyelograms). Dr. Ash and Dr. Peters are continuing the study of the use of hormonal therapy in advanced mammary carcinoma.

Dr. Ash, with Dr. N. C. Delarue of the Department of Surgery and Dr. W. T. Clark of the Department of Medicine, is continuing the study of the effect of bilateral adrenalectomy and oophorectomy on advanced mammary carcinoma.

Dr. W. E. C. Allt and Dr. J. C. F. MacDonald, in conjunction with Dr. W. K. Kerr of the Department of Surgery (Urology), are continuing the investigation into the use of Au-198 interstitially in carcinoma of the prostate.

Publications

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Surgery

Under the direction of Professor R. M. Janes

The reduction of final year lectures to one a day has been a great improvement. Students are now able to spend the whole day upon the wards to which they are attached. The teaching of emergencies remains difficult, however, because, with the great increase of the size of the city, students tend to live farther and farther away and as a result are inclined to go home earlier and to find it more difficult to return for night emergencies. It would be an advantage if living accommodation could be provided for all final-year students doing clinical work on the grounds of the hospital to which they are attached. They could become much more a part of the hospital staff. To make such a scheme really work, if the hospital became dependent upon their services, it might be necessary to make the final year eleven months in length.

The second-year didactic programme of surgery has been modified during this academic session to teaching the practical application of the basic sciences to disease processes and to providing the students with a sound foundation of fundamental knowledge upon which they may build in the future. The material has been co-ordinated with that dealing primarily with physical examination, presented by the Department of Medicine. A few introductory lectures were given by the head of the Department, but almost the entire weight of the programme has been carried by Dr. Norman Delarue, who deserves the credit for what is undoubtedly a very worthwhile improvement in our teaching.

The University programme of resident training for surgeons has maintained its popularity and has become more interesting perhaps in that in addition to graduates from many other Canadian schools, we now have trainees from the United States, India, Spain, Mexico, etc., while applications for admission to our training programme are being received from further afield each year. We have recently accepted

some men from India under the Colombo Plan for periods of four to six months and the arrangement seems to have been satisfactory to them. The increased facilities for surgical research have made it possible to extend to those from other countries the privilege of working in the Department.

The advanced graduate course, participation in the courses sponsored by the Medical Alumni Association and the Ontario Medical Association, and provision of lectures for the various places included under the Kellogg scheme, have occupied the time of many members of the Department.

The Balfour Lecture was given by Sir Harry Platt, President of the Royal College of Surgeons of England, his title being "The Backache Sciatica Problem." Mr. Henry Osmond-Clarke visited us under the aegis of the Rotary Club of Toronto and delivered a lecture entitled "Certain Deformities of Foot in Children." Professor René Fontaine of Strasbourg (John Homans Lecturer in Surgery) visited us for two days and gave a lecture on "The Surgery of Arterial Occlusion." Mr. Vaughan Hudson, F.R.C.S., senior surgeon of Middlesex Hospital, London, visited the school during the month of April on an exchange basis. Dr. Ian Macdonald of the Department of Medicine spent a month at Middlesex in the fall of 1955 in a like capacity. During part of his visit Mr. Hudson took over the teaching and consulting duties of the Head of the Department in his capacity of Visiting Professor of Surgery. The contribution which he made was much appreciated and it would seem that the value of this exchange has been established and that it will continue.

At the Western Hospital a new division of Orthopaedic Surgery has been established under the direction of Dr. William White. Special departments are being recognized gradually at the Hospital for Sick Children. The extra facilities are a contribution to our capacity for graduate training.

Dr. R. M. Wansbrough, Associate Professor of Surgery and Surgeon-in-Chief of the Hospital for Sick Children died suddenly on May 24th. His many years of service and his contributions to this University and hospital are gratefully acknowledged. He has been succeeded as Surgeon-in-Chief of the hospital by Dr. A. W. Farmer. Dr. G. M. Dale, Chief of the Division of Orthopaedic Surgery at Sunnybrook has retired on the age limit. Dr. S. D. Gordon has been made an Associate Professor, Dr. N. C. Delarue and Dr. E B. Tovee Assistant Professors and Dr. P. F. McGoey, D. L. MacIntosh, H. R. C. Norman, and D. R. Wilson have been advanced from the rank of Clinical Teacher to Associate. Dr. D. J. Currie has been appointed to the staff of St. Michael's Hospital and Dr. J. E. Mullens to the staff of the Wellesley Division of the General Hospital.

Numerous honours have come to members of the Department during this year. Dr. W. G. Bigelow received the Gold Medal of the International Society of Surgery at its meetings in Copenhagen. This medal is awarded for the outstanding contribution to surgical science during the previous year. Dr. E. H. Botterell has been asked to be chairman of a panel on hypothermia at the International Congress of Neurosurgeons meeting in Brussels in 1957 and to arrange the programme, also to attend as the representative from Canada the Tercentenary Celebration of Harvey's birthday at the meeting of the Harveian Society at the Royal College of Surgeons of England in June, 1957. Dr. A. W. Farmer has been appointed an Honorary Surgeon to the Queen for a two-year period. Dr. R. I. Harris has been made an Honorary Fellow of the Royal Australasian College of Surgeons, Honorary Member of the New Zealand Orthopaedic Association and Honorary Member of the Australian Orthopaedic Association. Dr. Harris received these honours while in Australia and New Zealand in his capacity as Sims Professor in Surgery. He is the first Canadian to have been given this appointment. Dr. W. E. Gallie was made an Honorary Fellow of the Royal College of Surgeons of Edinburgh on the occasion of the celebration of the 450th year since its founding. He also acted for one week as Visiting Professor of Surgery in the University of Edinburgh. Dr. Gallie's visit received much acclaim in Edinburgh and brought honour to this school. Dr. F. G. Kergin became a Hunterian Professor of Surgery of the Royal College of Surgeons of England. His address was

entitled: "The treatment of chronic pleural empyema." Dr. Stuart Gordon has been made a Trustee of the American Association of Plastic Surgeons. Dr. R. C. Laird is President of the Canadian Association of Clinical Surgeons. Dr. I. B. Macdonald was awarded the Medal of the Royal College of Surgeons of Canada for the prize essay in surgery for 1955; his essay was entitled: "Experimental studies with homologous renal transplants." Dr. W. R. Harris was invited to and attended the Ciba Symposium on "Bone and calcium metabolism" in London in July 1955. Dr. R. M. Janes delivered the first Vézina lecture in surgery in Quebec in April. This lecture has been founded in honour of the late Dr. Charles Vézina, Professor of Surgery and Dean of Medicine in Laval. Mr. Ian Todd, London, England; Dr. C. H. Drake, London, Ontario; and Dr. E. H. Simmons of Toronto obtained their "M.S. Toronto." The Lister Prize was awarded to Mr. Ian Todd for the best M.S. thesis and the George Armstrong Peters Prize to Dr. William Lougheed for his work in connection with the application of hypothermia to neurosurgery.

Research

Under the direction of and in co-operation with Dr. Bigelow, Dr. R. J. Baird and Mrs. M. Woodhouse and Dr. A. G. Gornall (of the Department of Pathological Chemistry) have continued studies on hibernation. This year an extract was obtained from the hibernating gland of the groundhog, which makes it possible to cool rats to lower temperatures. Dr. W. G. Waddell and Dr. B. Fairley (of the Department of Anaesthesia) have studied the biochemical changes in the blood during cooling, operation, and rewarming of all patients subjected to hypothermia during the past year. This interesting and important study has brought to light a metabolic acidosis which develops on rewarming. Ph and complete anion studies are in progress and the results are being confirmed by Dr. Waddell in animal experiments. Dr. D. R. Wilson and Dr. Bigelow have reviewed their results with eighteen patients that have had resection of aortic aneurysms and homografts with satisfactory results. Dr. F. G. Dolan, Dr. Ramsay Gunton (of the Department of Medicine) and Dr. Wilson have reviewed the cases of pericardectomy and Dr. Gunton is continuing a special study of these cases. Dr. R. O. Heimbecker and George Trusler have reviewed all cases of cardiac arrest and Dr. Heimbecker has prepared a film illustrating the mechanism of cardiac arrest.

Dr. E. H. Botterell and Dr. John Scott are continuing the study of the physiology of spinal man. Dr. Botterell and Dr. F. P. Dewar have been endeavouring to make a clinical assessment of the place of intervertebral body fusion following the removal of intervertebral discs.

Dr. Norman Delarue has continued to study the place of adrenalectomy in advanced mammary carcinoma. An endeavour is being made to establish criteria by which patients in whom a favourable response might be predicted may be chosen.

Dr. Dewar has continued to study the use of radioactive phosphorus in patients with fracture of the neck of the femur. This work is based upon Dr. Tovee's experimental work on animals.

Under the direction of Dr. A. W. Farmer research into new methods for the treatment of burns is being continued at the Hospital for Sick Children.

Dr. W. R. Harris, with the assistance of Dr. Gordon Dale and in association with Professor Ham, has continued the studies of healing after epiphyseal injuries. This has involved a careful study of the mode of blood supply to various epiphyses and the influence this has upon the prognosis following epiphyseal separation. Dr. Dale has also conducted an investigation into the origin and nature of osteoclasts.

Dr. Heimbecker has worked with Dr. Bigelow in the attempt to establish "hibernating hormones," and is studying hypothermia with special reference to blood cooling and selective hypothermia of brain and myocardium. Homograft aortic valve transplants are being studied in dogs especially with regard to their ultimate fate and possible application to aortic valve disease in humans. Clinical studies in

selective angiocardiography and left heart catheterization in the study of aortic and mitral valve disease are being conducted in co-operation with the Departments of Medicine and Radiology.

Dr. W. J. Horsey, in collaboration with Dr. Carl Ezrin of the Department of Medicine, has continued research in the field of hypothalmo-hypophyseal relationships. Initial experiments indicated that the protein-bound iodine in the cat could be elevated by placing electrolytic lesions in the posterior hypothalamus, but it has not been possible to reproduce these findings.

Dr. G. H. C. Joynt is endeavouring to produce emphysema in dogs by placing a rubber tricuspid valve in the bronchus.

Dr. W. K. Kerr is studying the effects of the interstitial injection of radioactive gold in the prostate.

Dr. James A. Key has studied further the use of jejunal pedicle grafts to supplement the coronary circulation of the dog and now feels that experimental evidence warrants a clinical trial of the method. Methods and value of arterial homograft substitutes are being investigated in a controlled experiment in animals. The results of arterial by-pass grafts in patients with obliteration arterial disease are being studied in patients at the Toronto General Hospital and the Sunnybrook Hospital.

Dr. W. K. Lindsay is conducting a further experimental study of the factors responsible for functional and pathological changes in digital flexon tendons following trauma and surgery, including the fate of free tendon grafts. A twenty-year follow-up of cases of tumour of the jaw in children, long-term follow-ups of the results of treatment and the over-all rehabilitation of cleft palate and of soft tissue tumours in children are under way.

Dr. L. J. Mahoney has conducted clinical research into the value of intracutaneous sensitivity tests before the administration of antitetanic serum and the effect of allergic reactions on the passive immunity provided by 1500 units of A.T.S. given subcutaneously.

Dr. D. L. MacIntosh has in progress a follow-up of patients who have had radiation fractures of the neck of the femur.

Dr. K. G. McKenzie is doing a clinical research into the surgical treatment of spasmodic torticollis.

Dr. T. P. Morley is making satisfactory progress in the culture of intracranial tumours *in vitro* and a publication upon the subject will appear in the near future.

Dr. R. A. Mustard with the assistance of Dr. Harry Hyde has continued the investigation of the use of radioactive gold in the study of lymphatic drainage. A survey of all cases of cancer of the oesophagus treated at the Toronto General Hospital has been completed and a follow-up study of cases of hiatus hernia is under way.

Dr. W. T. Mustard is continuing experimental studies on the artificial heart with biological oxigenator. Present investigations include transpositions of the great vessels and an operation to correct this deformity.

Dr. George Pennal is investigating the blood supply of the Talus by the injection technique.

Dr. G. R. Ranking, in collaboration with Dr. Fitzgerald of the Department of Medicine, is investigating the place of renal biopsy in the study of medical and surgical kidney disease.

Publications

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Botterell, E. H.; Lougheed, W. M.; Scott, J. W. and Vandewater, S. L. "Hypothermia and Interruption of Carotid, or Carotid and Vertebral, Circulation in the Surgical Manage-

ment of Intracranial Aneurysms" (*Journal of Neurosurgery*, vol. 13, no. 1, Jan., 1956, pp. 1–42).

DELARUE, N. C. "Fundamental Concepts determining a Philosophy of Treatment in Mammary Carcinoma: A Review" (*Canadian Medical Association Journal*, vol. 73, no. 8, Oct. 15, 1955, pp. 597–614).

——— "Recovery of Functional Activity in the Shoulder and Arm Following Radical Mastectomy" (*ibid.*, vol. 73, no. 9, Nov. 1, 1955, pp. 704–9).

——— "Results of Œstrogen Deprivation Therapy in Metastatic Mammary Carcinoma" (*ibid.*, vol. 73, no. 8, Oct. 15, 1955, pp. 641–54).

——— "Rotator Cuff Tendonitis and Bicipital Tenosynovitis" (*ibid.*, vol. 73, no. 3, Aug. 1, 1955, pp. 201–7).

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HARRIS, R. I. "Bone Anomalies of the Tarsus in relation to Peroneal Spastic Flat Foot" (*Journal of Bone and Joint Surgery*, vol. 37 B, no. 2, 1955, pp. 357–8).

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——— *Fundamentals of First Aid*. Ottawa: St. John Ambulance Association of Canada. 1955. Pp. 116.

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THOMSON, S. A. "Abdominal Pain in Children" (*Bulletin of the Hospital for Sick Children*, vol. 4, no. 6, Nov., 1955, pp. 76–81).

——— "Modified Denis Brown Splint for Unilateral Club-foot to Protect the Normal Foot" (*Journal of Bone and Joint Surgery*, vol. 37 A, no. 6, 1955, pp. 1286–7).

——— "Pre- and Post-operative Orders for Abdominal and Bowel Surgery" (*Bulletin of the Hospital for Sick Children*, vol. 4, no. 3, May, 1955, pp. 32–4).

Therapeutics

Under the direction of Professor K. J. R. Wightman

No significant change in the teaching programme has occurred, although the content of the course requires frequent revision since the subject is one which is changing rapidly. The practical seminars which are conducted in the fourth year were given by Drs. A. Bruce Robertson, P. Rosen, and G. E. Hart. At the same time a similar type of instruction in physical medicine was carried out by Dr. Gardiner and Dr. Jousse. In the third medical year the course has been strengthened by the reorganization of the Clinical Pharmacological conferences which are carried out under the auspices of the Departments of Medicine and Pharmacology with the collaboration of this Department. It is planned that this instruction be moved to the fourth medical year, where it may prove even more helpful to the students. The assistance of Dr. M. A. Ogryzlo and the members of the Neurological Service in the Department of Medicine is acknowledged in giving the lecture course and theatre clinics throughout the year. The work of Dr. B. Hazlett in preparing cases for the weekly theatre clinics and in revising the exercises handed in by the students has been most helpful.

Research

Dr. Barbara Hazlett, the Fellow in Therapeutics, has been carrying out studies on newer treatments of leukaemia. She has also been investigating red cell survival in various haematological disorders, using radioactive chromium as a tracer. A project initiated by Dr. C. J. Bardawill to study the changes in red cell arginase in leukaemia, cancer and various other conditions, has been concluded this year. The Head of the Department has carried on as supervisor of the work of Dr. J. M. Finlay and Dr. E. A. McCulloch, whose activities are reported under the Department of Medicine. It is perhaps notable that an increasing number of requests for clinical trials of new products are being received from the various pharmaceutical houses.

Publications

McCulloch, E. A.; Bardawill, C. J.; Britton, A., and Wightman, K. J. R. "Effect of Growth Hormone and ACTH on Plasma Phospholipid Levels and Phospholipid Turnover in Man" (*Journal of Clinical Investigation*, vol. 34, no. 6, June, 1955, p. 952).

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Physical and Occupational Therapy

Under the direction of Dr. A. T. Jousse

There have been several staff changes. Miss Marjorie Spence is on leave of absence for a year, and will assume full-time teaching duties in physical therapy at the University of Montreal. Miss Elma Shaw, who spent the past year with us, will return to her post at the Royal Infirmary, Edinburgh. Mrs. Wilma Marion Brown and Miss Wilma Jane Hudson will be taken on as Instructors in Physical Therapy, having completed the Teachers' Training Course in Physical Therapy this year. Dr. F. C. Monkhouse has once more returned to the Department of Physiology and is acting in conjunction with Dr. W. G. B. Casselman as a Lecturer in Physiology.

Miss Irene Frances Woolford will continue in the Teachers' Training Course, having completed successfully the work of the first year. She is acquiring a mastery of the French language, as she plans to return to teach on the staff of the University of Montreal where lectures will ultimately be given in French.

During the summer months many of our staff avail themselves of the opportunity to visit centres on this continent and in Europe. Some of the younger members practise Physical or Occupational Therapy in hospitals across the country.

In May, 1956, 81 young women graduated in Physical and Occupational Therapy. Of this number 5 graduated with honours and 76 passed without being conditioned. Two additional students were conditioned in one subject and write supplemental examinations in September.

The decline in enrolment is difficult to account for, and is probably not for purely economic reasons as has been suggested, since the reward for this type of work is comparable to that received by nurses and other young women rendering service to the sick.

As a whole this group have excelled in athletic competition and for the second year won the women's interfaculty championship in hockey. Several won a place in intercollege competition, and still others participated in University activities, performing as leaders of the cheering section and generally taking a worthwhile part in campus affairs.

The number of men who apply for admission to the course is not great and they generally do not have the qualifications necessary for admission.

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Committee on Experimental Research

Chairman: Professor J. D. Hamilton

Supervisor: Professor R. C. Ritchie

This year is the second year during which the work of the Committee has been supported through contributions from grantees in addition to the University budget. The method of charging the various grants on the basis of a percentage of the service already rendered within the framework of the University accounting system has worked smoothly, when employed with foresight. This year has seen a more equal contribution by all research projects which use the services. Whereas, during 1954–5, contributions were made chiefly by those with sufficient funds available, during the present year all grantees have found it possible to share in expenses. We now employ five animal and operating room attendants and one secretary.

During 1955–6 there have been heavy expenditures in the reconstruction of the animal quarters. Special housing was prepared for Dr. Kerr's dogs (radioactive gold), Dr. Nicholson's dogs (metabolism studies), and Dr. Ezrin's monkeys (endocrine studies). In addition a heat-controlled room has been prepared for Dr. Gornall's rats (adrenalectomized). Space for dogs and small animals has been improved and used more efficiently. This has been achieved by combining two small rooms to make one large general room for small animals, and combining a hallway and two cubicles to make a new room for dogs. Repairing and ventilating the long room for dogs and remaking the floor of the outdoor section have improved the quarters immeasurably. Although a number of small details remain to be finished, the general aspect of the animal quarters is now one of cleanliness and complete occupancy. The vermin problem is coming under control.

Our secretary is now situated in room 512A on the fifth floor, in the animal operating theatre. In this new situation, her services will be more available to all engaged in research. In addition to her present functions of keeping files and ordering supplies, she will be able to provide telephone answering service in the animal operating theatre, and to assist in typing reports and theses. Suggestions concerning other services which the Committee might undertake to our common advantage are solicited.

Two comments on the future might be mentioned here. Now that the Committe has excellent facilities for operations on animals and fairly good facilities for their care, it is suggested as sound policy that all who need such services make use of them to their fullest advantage. The staff of the Committee is always willing to adapt, if at all possible, to particular and peculiar needs. The second comment relates to attendants for the animals. We have had some excellent attendants. Suggestions are requested on the subject of ways and means of inducing them to stay on our staff.

I should like to pay tribute at this point to Dr. R. C. Ritchie's contribution to

the Committee. All the improvements in the animal quarters have been designed by him and carried out under his supervision. It is indeed fortunate that Dr. Ritchie's services will continue to be available to the Committee, although he is resigning his full-time appointment in the Department of Pathology.

Banting and Best Department of Medical Research

Reported by Professor Charles H. Best

Professor C. C. Lucas and Dr. Jessie H. Ridout, with Professor Best, have conducted further studies on dietary factors that prevent or cure fatty livers and cirrhosis. Significant differences were noted in the effects of seven dietary fats on the deposition of fat in the liver and on the induction of haemorrhagic kidney lesions in young rats. The concentration of cholesterol in the blood sera from these rats was determined by Dr. Jean M. Patterson who has also assisted Dr. Lucas and Dr. Ridout in further studies of the extractability of phospholipids from tissues by acetone and a comparison of the material thus obtained with that of acetone-resistant phospholipids extracted with hot alcohol or chloroform-methanol. With the help of Miss Mary Morrison, Dr. Lucas has begun a comparative study of the tendency for certain dietary staples (kidney beans, white corn, brown rice, potatoes, and whole wheat) to induce liver damage in rats when used almost exclusively as food over a large portion of the life span. Effects on blood lipids are also being noted. Dr. R. J. Young and Dr. Patterson, with Dr. Lucas and Dr. Best, have completed some lipotropic dose-response studies in rats and have investigated the role of dietary betaine and vitamin B_{12} in the biosynthesis of choline by the rat. Mr. K. K. Govind Menon, with Professor W. G. B. Casselman and Professor Lucas worked on a biochemical method for the determination of fibrous connective tissue. This would permit one to make more precise estimates of cirrhosis and liver fibrosis than can be made by the present histological examination of many sections. Mr. R. J. Gillespie with Dr. Lucas is continuing the study of alcohol as a factor in producing liver damage. In the absence of intoxication, the liver damage due to consumption of alcohol appears to be the result of an induced choline deficiency rather than a poisonous effect of alcohol. The liver damage from a given dose of alcohol is more severe when it is consumed some hours before the protective food than when the alcohol and food are taken together. Intoxication seems to produce liver damage not seen when equal amounts of alcohol are ingested more gradually without intoxication.

In Dr. Best's section, Dr. J. M. Salter and Mr. I. W. F. Davidson have shown for the first time a clear-cut diabetogenic effect of glucagon, the pancreatic hyperglycaemic factor. Glucagon produces intense hyperglycaemia, glucosuria, azoturia and weight loss in forcibly fed rats and a similar but less marked change in dogs fed *ad libitum*. Attempts are currently being made to produce permanent diabetes with this substance. Other lines of investigation have revealed that glucagon greatly increases gluconeogenesis. Studies performed with Professor D. W. Clarke indicate that glucagon enhances peripheral utilization of glucose. These findings suggest that the diabetogenicity may be due to over-production of carbohydrate rather than decreased peripheral utilization.

Mr. Davidson and Dr. Salter have continued to investigate the role of caloric intake in the protein anabolic action of insulin in the hypophysectomized rat. Insulin cannot induce protein synthesis on a restricted food intake. The anabolic action is dependent upon an increased consumption of carbohydrate. Conversely the protein-sparing action of carbohydrate is dependent upon an adequate supply of endogenous insulin. An increase in the caloric intake in the form of fat does not appear to assist protein synthesis in the insulin-treated hypophysectomized rat.

Dr. B. Rosenfeld and Miss Jessie Lang have continued their studies of the

influence of choline deficiency on the level of serum phospholipids in rats and dogs. They found that in the presence of dietary choline the level of serum phospholipids is dependent both on the state of absorption and on the level of dietary protein. The parallelism between low serum phospholipid levels during both the post-absorptive period and the absorptive period while on a low protein diet pointed to the simultaneous requirement of both choline and protein for a normal serum phospholipid level. In choline deficiency serum phospholipid levels are independent of both the absorptive state and the level of dietary protein.

In addition to the manifestations of choline deficiency on the serum phospholipids of dogs reported earlier, it was found that choline deficiency caused a higher retention of bromsulphophthalein as compared with normal dogs. Curative treatment with dietary choline restored the degree of retention to normal.

In Professor Erich Baer's sub-department of Synthetic Chemistry, the synthesis of naturally occurring phosphatides and the elucidation of their structure have been continued. Dr. D. Buchnea has been undertaking the synthesis of fully unsaturated mono- and bis-phosphatidic acids as cardiolipin substitutes. The serological investigation of these compounds and of L-alpha-(dioleyl) lecithin whose synthesis has recently been accomplished by Dr. Buchnea, is being carried out in the Laboratory of Hygiene, Department of National Health and Welfare, Ottawa. The L-alpha-(dioleyl) lecithin was found to be a very satisfactory replacement for beef heart lecithins as antigen component in the serodiagnosis of syphilis. The synthesis of L-alpha-(dioleyl) cephalin by a method similar to that developed for the synthesis of the corresponding lecithin compound has been undertaken successfully by Dr. Buchnea. Several preparations of fairly pure L-alpha-(dioleyl) cephalin were obtained.

Dr. Donald D. Clarke has attempted to improve a procedure developed by Dr. J. Maurukas for the synthesis of L-alpha-(distearoyl) phosphatidyl L-serylglycylglycine. The synthesis of other phosphatidyl peptides is in progress. The preparation of intermediates in carbohydrate metabolism and photo-synthesis was continued. Mr. J. Ciplijauskas has been able to improve considerably his procedure for the synthesis of vinyl phosphate. The ester can now be obtained in good yields and with a purity of approximately 95 per cent. A preliminary study of the chemical properties of vinyl phosphate suggests that the current methods for identifying the intermediates of carbohydrate metabolism and photo-synthesis would fail to reveal its presence. Mr. H. H. Flehmig has ably assisted the various members of the sub-department in their research work.

Dr. Casselman has continued a series of integrated biochemical, cytological and histochemical studies. Two of these are on the livers of choline-deficient rats. The first, in collaboration with Dr. Young, is an extensive investigation of the changes in lipids, proteins, nucleic acids, connective tissues, and water occurring during the development of cirrhosis and the subsequent reversal of these changes when the diet is supplemented with lipotropic factors, additional protein, or both. The second is concerned with the effects of antioxidants and other substances upon the rates of development of cirrhosis and formation of ceroid. Dr. Benito Lombardi, from Italy, has been assisting with both investigations and carrying out some related experiments of his own. Mr. Govind Menon has been establishing the biochemical method for estimating collagen and making such determinations on the livers. Dr. Casselman has also collaborated with Dr. Edouard Schönbaum on similarly integrated studies of the adrenal cortex particularly in relation to steroid synthesis *in vitro*.

With the assistance of Mrs. Marlene Wilbur, Dr. Casselman has been investigating several hepatomas and other transplantable tumours by histochemical methods and interference microscopy. In addition, these studies have contributed to advances in microscopic interferometric techniques. Dr. Donald L. Anderson has been working on fundamental problems concerning the histochemistry and physiology of connective tissues. Dr. Rosa Rappaport examined many of the 12,468 tissue sections

prepared for other members of the Department and of the Department of Physiology and provided detailed histological reports for the various investigators. Mr. William Wilson concluded his work with Dr. Calvin Ezrin, of the Department of Medicine, on the cytology of the adeno- and neurohypophysis. After being with this department for ten years, Mr. Wilson has left to join Professor W. Stanley Hartroft in St. Louis. Dr. John Logothetopoulos of Athens has recently joined this section and will be interested in the histology of the pancreas.

In Professor G. A. Wrenshall's section measurements of transfer rates on the one hand and of factors in the pancreas on the other are proceeding. Dr. Margaret Henderson has completed a study of the effects of insulin on the rates of transfer of plasma glucose in the depancreatized dog using a generalized mathematical basis for rate measurements by isotopic tracers which has undergone further direct operational tests by Mr. H. Schachter. Dr. Margaret Bates is applying the transfer rate theory to measure plasma lipid transfer rates in the dog under the influence of factors and conditions known to affect plasma lipid levels. Mr. L. Lax, Mr. S. Sidlofsky, and Dr. Wrenshall have completed a whole-system measurement of phosphorus transfer rates in the normal rat and similar measurements are now being made in the alloxan-diabetic rat with and without insulin therapy by Dr. G. Koike, from Japan, and others. Professor G. R. Williams, from England, who has recently joined the section, is initiating studies of rapidly changing rates of transfer and transformation in biological systems.

Some of the specific studies on the insulin and glucagon of mammalian pancreas described in the preceding report have progressed or have been completed. Interesting parallels have been drawn between the amount of insulin extractable from the pancreas and the blood-sugar depressing action of oral sulfonylureas in diabetic man. The significance of sex differences in the amount of insulin extractable from diabetic human pancreas is under study by Dr. Wrenshall and others. Mrs. Beverly Schaeffer is studying the effects of procedural variations on the efficiency of our standardized procedure for insulin extractions.

Dr. W. J. Linghorne, assisted by Mrs. M. Hineman, is continuing his research on periodontal disease. Regeneration of lost supporting structure, bone and connective tissue and mucous membrane has been induced experimentally by two methods. Further study of these two regenerative processes is being carried on to clarify the manner in which these regenerative processes operate. It is expected that such knowledge will contribute to the scientific development of periodontal therapy and that of other lesions involving bone and connective tissue.

Dr. Anna Sirek performed successfully total pancreatectomies in rats and transbuccal hypophysectomies in puppies. The action of the new anti-diabetic sulfonamide BZ-55 was studied in surgically depancreatized and Houssay dogs. Although the insulin requirement of these animals was significantly lowered by BZ-55, small amounts were necessary. In collaboration with Dr. O. Sirek the nature of the hyperglycaemic factor present in the blood of the pancreaticoduodenal vein after injection of growth hormone preparations was studied.

Dr. George Wilgram has continued his intensive studies of hardening of the blood vessels produced by choline deficiency. The new monkey colony promises to provide results of very great interest.

In the section of Professor W. R. Franks, the application of radiation chemotherapy of cancer has been extended to include a number of substances which have shown promise of liberating a toxic product as a result of radiation chemical change, but the influence of these substances when applied *in vivo* has been somewhat disappointing. It is probable that the difficulty is inherent in the nature of the malignant process which consists of over a million autonomous self-replicating units per milligram of tissue, any one of which is theoretically capable of propagating the disease. The dose response curve of transplanted tumour is very flat, suggesting an all or nothing response. The success of the therapy, then, is highly dependent on any small resistance the host may manifest towards the residual cancer.

With the assistance of Mr. J. Skublics, Miss M. M. Shaw, and Miss A. McGregor, we have been able to show that for a given dose of radiation the number of cures obtained in various homologous strains of animals varies with the degree of natural resistance to the tumour. Animals in which the tumour has been caused to regress show a well-marked immunity to further growth of the tumour. In attempts to transfer this acquired immunity to animals with irradiated tumours, earlier negative results were put in a new perspective when it became apparent that homologous tissues such as spleen normally elicit a tumour-stimulating action, presumably owing to desensitization of the host. The actual presence of a passive-immunity factor is revealed by the increased resistance of animals given spleen tissue from donors made immune by having tumours cured by X-ray, as compared with results from similar spleen homogenates from non-immune animals. Methods of obtaining the inhibitory factor free from the stimulating element are under study.

The majority of individuals (even heavy smokers) do not die of cancer and this resistance is not fortuitous. In a preliminary series, animals which have failed to produce cancer from a chemical carcinogen have proved resistant to transplanted tumour growth. The cure for cancer may well lie in the passive transfer of such resistance mechanisms to a level that will allow susceptible victims to overcome tumour residues which may survive orthodox methods of therapy.

Dr. Roy Bather, British Empire Cancer Campaign Exchange Fellow, has continued his studies on virus diseases as related to cancer with particular reference to the above work. With Mr. G. A. Meek studies are being made on the possible application of ultrasonic disintegration of tumour tissue to the problem of virus carcinogenesis or specific (non-infective) antigen formation. This apparatus has been kindly loaned by the Rogers Majestic Electronics Limited.

We are indebted to the National Cancer Institute of Canada for continued aid in this programme.

Mr. C. S. Lennox with Dr. Franks has continued studies with a method developed to detect hypoxia post mortem as a cause of fatal accidents. Application of the present method is being extended by tests carried out co-operatively at the School of Aviation Medicine, USAF Air University, Randolph Field. The work with Mr. Meek on the development of a micro recording-accelerometer has been extended to a limited production basis with a view to calibration in the field. These activities are carried out under the auspices of the Defence Research Board of Canada.

The services of the Comptroller, Mr. C. R. Cowan, both to this Department and to the Department of Physiology, continue to be invaluable.